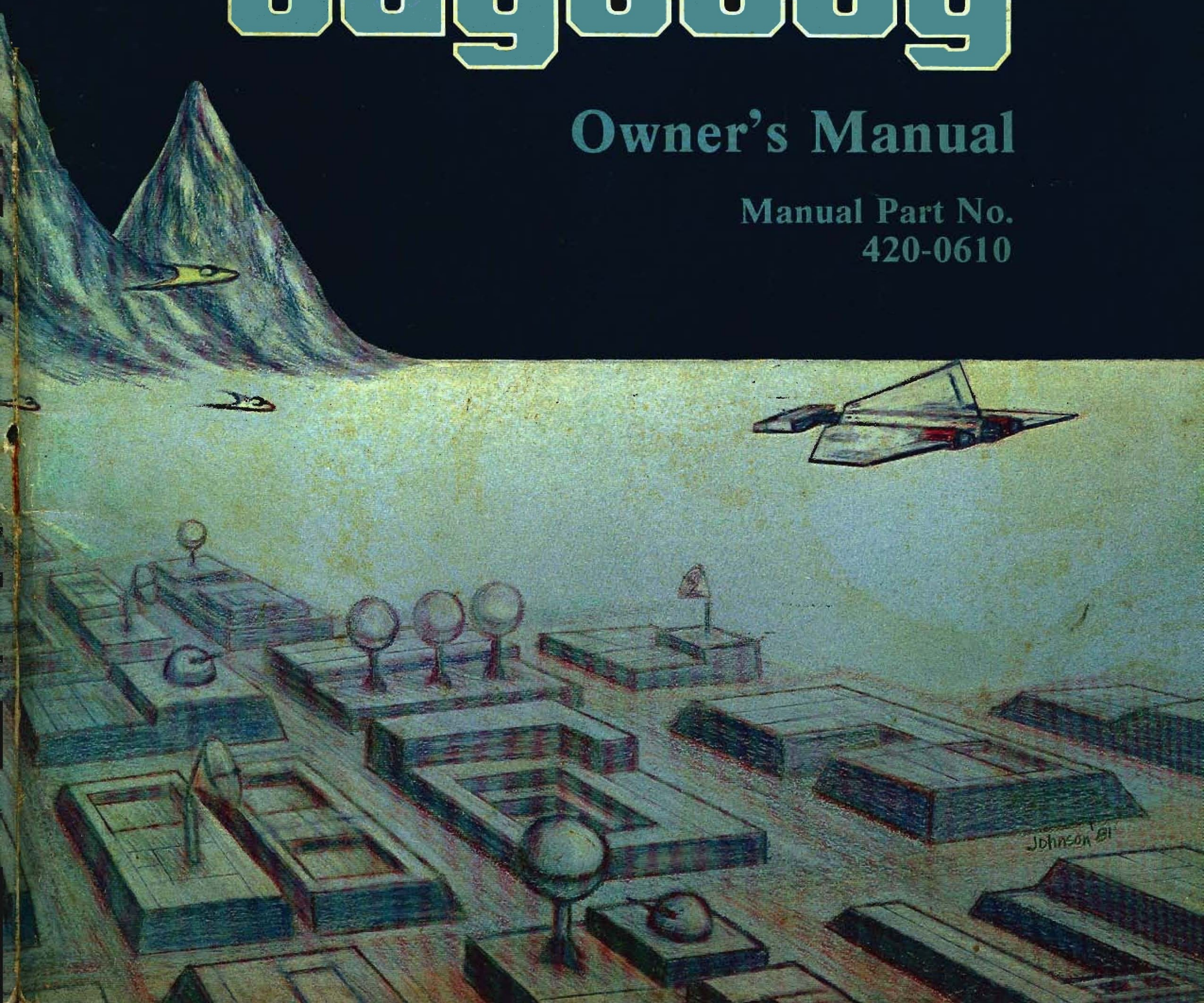
SEGA/Gremlin

Space Odyssey™

Owner's Manual

Manual Part No.
420-0610



Space Odyssey™

Owner's Manual

Manufactured
By
SEGA®/Gremlin®
TLX 910-335-1621

table of contents

introduction

Space Odyssey is an electronic game that makes extensive use of digital circuitry and television monitor concepts. This manual is designed for the maintenance technician who possesses a general knowledge of solid state circuitry, microprocessor and digital integrated circuiry, and TV monitor concepts. Any individual **not** knowledgeable in these areas **should not** attempt repair of the electronic portion of the game.

Gremlin's new G-80 system makes troubleshooting easy. Each board has a separate function and most problems can immediately be isolated to a single board. The individual boards contain less circuitry than if they were combined on one or two boards. This results in faster and easier servicing. The new G-80 system gives Gremlin a lot more flexibility in designing new games.

If you have any questions not answered in this manual, call SEGA/Gremlin Customer Service, (800) 854-1098.

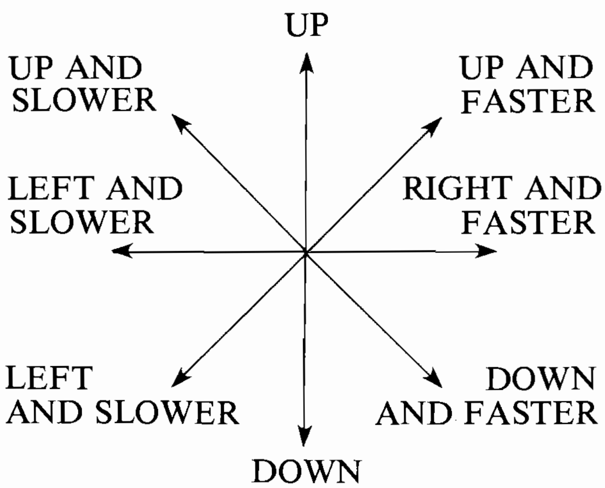

Space
Odyssey

game concept

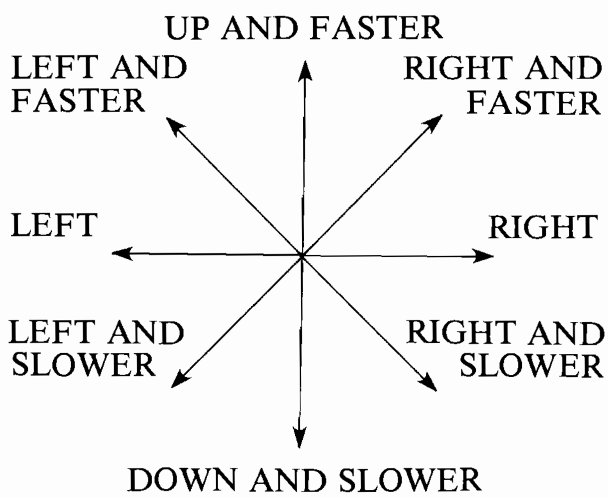
Space Odyssey is a one or two player game in which a player tries to destroy enemy aliens in seven sectors. A player proceeds through seven sectors of cosmic cities and space mountains.

A player maneuvers through the sectors by moving a joystick in eight different possible directions. Up or down in the horizontal mode, left or right in the verticle mode. The diagram shows the variable speeds and direction of movement.

HORIZONTAL SCENE



VERTICAL SCENE



SCORING

As a player proceeds through the sectors, the higher the sector, the higher the possible scores that can be obtained by destroying UFO's.

Sector 1- 100-900 points can be obtained
Sector 2- 200-900 points can be obtained
Sector 3- 300-900 points can be obtained etc.

If a player's ship crashes into a UFO, the ship is lost, but the player is awarded the points for destroying the UFO. If a player's ship is destroyed by a UFO bullet no change in score occurs. When a player's ship explodes, a new ship appears in the present sector until all the player's ships are destroyed. Bonus points called "Distance Points" are awarded for the successful completion of each round.

GAME ACTION

As players enter each new sector they encounter enemy aliens. Players must avoid the mountains because they will destroy the ship. If a player enters a black hole they remain there for three seconds in a whirlpool. The faster a player goes, the more bonus points a player receives. In a two player game, players alternate after the destruction of each ship. The game ends when all ships are destroyed.

game set-up and inspection

1. Inspection

a) **Before** plugging in your new game, inspect it closely to spot any possible shipping damage. Check to ensure the graphics are in place, the monitor is not damaged and that the overall cabinet is in good condition condition.

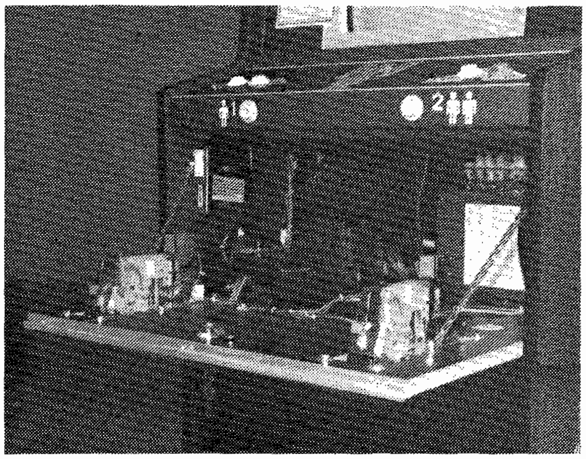


Figure 1

b) Open the coin mechanism door (see figure 1) and inspect the inside of the game electronics compartment. Be sure no components or connectors have come loose. Proper connector fittings must be checked **before** game power is applied. Check all related connectors for good contact. Although disconnected connectors are easily spotted, poor contacts are difficult to locate. The connectors should therefore be pushed in firmly and then loosened to spot poor connections.

c) Are the fuses intact? There are five fuses (not counting the monitor fuses which are detailed in the monitor manual for this game). One fuse is located on the AC junction box. The other four are on the power supply PC board. See figure 2.

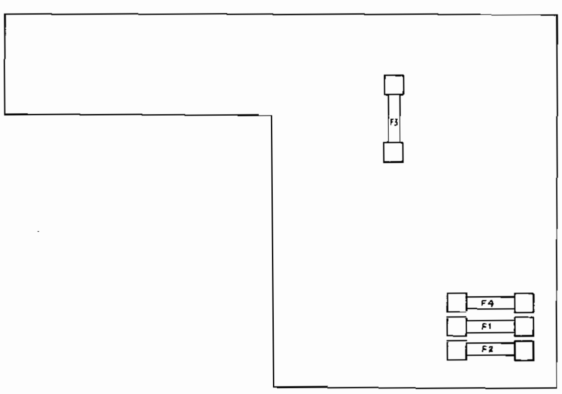


Figure 2

2. Voltage Selection

Before plugging in your game, make sure that the game voltage is correct for your location. Locate the two leads from the AC junction box to the power transformer. For 110 VAC, they should be connected to terminals 1 and 3 on the power transformer. For 100 VAC, connect 1 and 2, and for 220 VAC applications, they should be connected to 1 and 4. See figure 3.

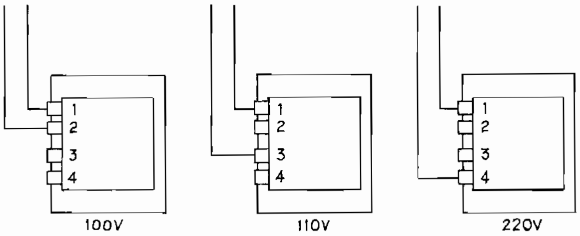


Figure 3

You will also notice on the AC junction box that there is a safety interlock switch. When the front panel is in place, the switch is depressed and the game receives power. Removing the front panel, the switch returns to its original position and the power is cut off from the game. For servicing, this switch can be pulled out and power will be restored. See figure 4.

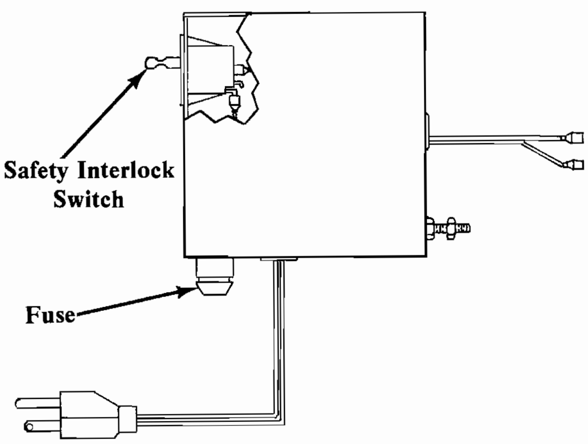


Figure 4

3. Game Specifications

Power	100 VAC, 60 HZ (nominal), 150 watts max
	110 VAC, 60 HZ (nominal), 150 watts max
	220 VAC, 60 HZ (nominal), 150 watts max
Dimensions	25½ inches wide X 30¼ inches depth (64.8 cm wide X 76.8 cm depth)
	72½ inches height (184.2 cm height)

4. Important Notes

a) The following note is included in compliance with FCC rules: **WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. As temporarily permitted by regulations, it has not been tested for compliance with the limits for Class A computing devices pursuant to Subpart J of Part 15 FCC Rules, which are designed to provide reasonable protection against interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.**

b) Miscellaneous

Never remove circuit board connections while power is on.

Never replace any components with anything other than exact replacement parts.

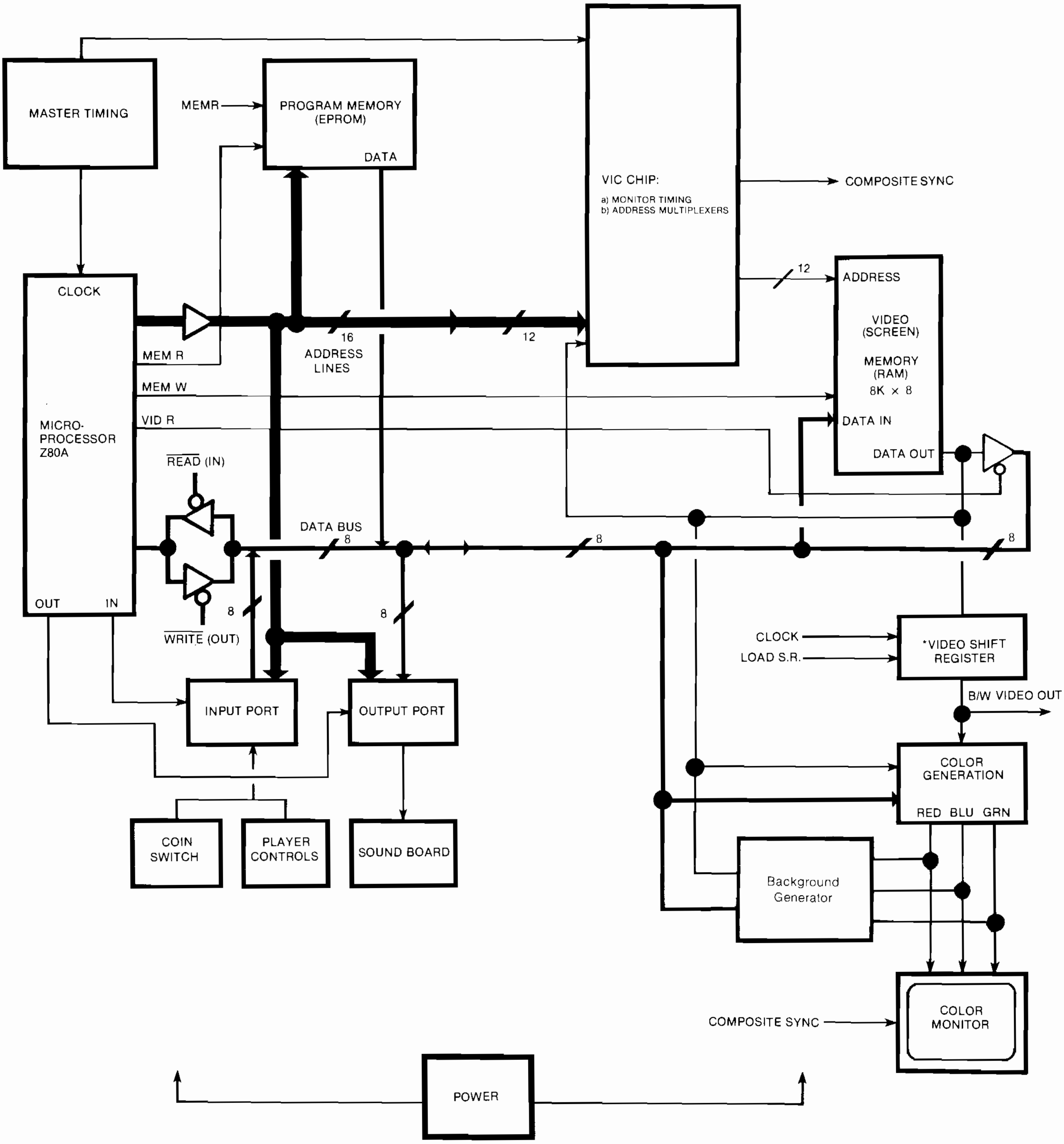
DO NOT replace fuses with anything other than the proper value. A blown fuse indicates an overload condition within the game. Replacing the fuse with a higher value can cause severe damage to internal components, if an overload occurs.

Correspondence regarding this game should be addressed to:

SEGA/Gremlin
8401 Aero Drive
San Diego, California 92123
ATTN: Customer Service
(800) 854-1098

G-80 theory of operation

Game Block Diagram



* DENOTES CIRCUITRY CONTAINED IN VIC CHIP.

1. G-80 Boards:

The G-80 system consists of five boards that plug into a mother board. They are the CPU, Background Generator, Sound, Video and EPROM boards. They plug into the mother board in a card cage system to simplify repairs and cut down on interference to outside communications systems. The mother board is cross-wired to allow for the boards to be plugged-in in any order. Listed below are the bus pin assignments on the mother board:

1	Ground	A	Ground
2	A15	B	A7
3	A14	C	A6
4	A13	D	A5
5	A12	E	A4
6	A11	F	A3
7	A10	H	A2
8	A9	J	A1
9	A8	K	A0
10	D7	L	D3
11	D6	M	D2
12	D5	N	D1
13	D4	P	D0
14	WAIT	R	RESET
15	INT	S	EDGINT
16	NMI	T	EXT
17	EXT Φ SEL	U	Φ OUT
18	MEMR	V	MEMW
19	INPUT	W	OUTPUT
20	RFSH	X	MREQ
21	INTACK	Y	AC
22	+5V	Z	+5V
23	+5V	a	+5V
24	—5V	b	—5V
25	+12V	c	+12V
26	—12V	d	—12V
27		e	
28	HALT	f	MI
29	Φ/2	h	*
30	*	j	*
31	SRC	k	*
32		l	
33		m	
34		n	
35		p	
36		r	
37		s	
38		t	
39		u	
40		v	
41		w	
42		x	
43		y	
44	Ground	z	Ground

*For Development Purposes Only

a) CPU Board (Refer to CPU Schematic, sheets 6 and 7)

The CPU board is completely timed with the video board. But, for testing purposes it contains its own clock circuit, powered by an 8.000 MHZ crystal. Pin 17 is the external clock select and is grounded when the video board is plugged in. When the external clock pulse comes in through pin T, it goes directly to the CPU and the entire CPU clock circuit is disabled. The WAIT signal, entering in at pin 14, is used to synchronize slower memory accessed by the CPU. The NMI circuit, entering in at pin 16, contains a switch for activating the built-in self-test. The self-test system will be explained more fully later.

When the edge interrupt circuit, entering at pin S, goes LO, it triggers an interrupt in the CPU. The CPU stops whatever it is working on, completes the activity required by the interrupt, and then returns to the function it was performing prior to the interrupt. It is a negatively triggered interrupt, which can be disabled by the CPU at any time.

The AC signal, entering in at pin Y, combines with RESET at pin R and the input from the reset switch located on the operator panel to reset the CPU. Disregard PANEL RESET at pin 30. This circuit is used only for system development.

The CPU in **Space Odyssey** is a Z80A. You must **always** use a Z80A as the Z80 is not fast enough to run the game. U21 is an address bus controller. Eight of the sixteen address lines pass through U21 before addressing the RAMs and the Eprom at U25. U25 contains the data for the self-test and contains features common to all games, such as coin acceptance, credit/coin handling, power-up sequence, player 1 or 2 recognition and CPU initialization. U3 is an output

port for the CPU and U4 is the input port. Connector P1, pins 23 through 40, shown on sheet 6 is not used in **Space Odyssey.** U15, located below U4 on the schematic, decodes memory select on the CPU board. Sheet 7 contains the coin inputs, player inputs and inputs from the operator panel. The coin circuitry contains ICs U6, U39 and U16. U9 is the input port for the coin switches and service switch. Player inputs enter through connector P1, pins 15 through 22.

b) Video Board

The video board contains a VIC chip used in previous games (U58). The video board also contains a 15.468 MHZ crystal that generates the timing signals for video generation. Because the video board contains twice as many RAMs, as used in previous game boards, it has a more extensive graphics capability. Color capability is greatly expanded because of a color RAM, U9, which allows the program to create a wider variety of color schemes. There are 8 shades of red, 8 shades of green, and 4 shades of blue. The video board also contains circuitry (U34, U35, U36, U38, U49 and U50) to make the picture "flip" for cocktail table models.

On the G-80 video boards for **Space Odyssey,** a small sub-board, called the HARDWARE SHIFTER, is mounted in socket U12. This board speeds up the generation of video information on the screen. Normally, character generation is performed by the microprocessor. However, in order to speed up character movement, we cannot just speed up the microprocessor. So, the speed increase must be performed by the Hardware Shifter circuit. It does this by shifting data from the CPU and feeding it directly to video RAM. The shifter circuit, then, drastically reduces the number of software operations the CPU would have to perform to do the same thing. As game play becomes more sophisticated, increased speed of movement is a vital element of this sophistication.

On some G-80 Video I Boards, you will see the VIC Replacement Board. This board is, in part, the equivalent circuit of the VIC chip. It is a simple circuit consisting of a number of counters and multiplexers for generating video timing and addressing video RAM.

c) EPROM Board

The EPROM board contains a relatively simple memory system. It can hold up to 23 2716 EPROMs totalling 46k bytes of memory (1 byte equals 8 bits). U24 and U30 decode all the EPROMs; U25 is the buffer IC to the data bus. In operation, any one of 23 EPROMs is selected by 5 CPU address lines.

d) Background Generator Board

The Background Generator board is an additional circuit found in **Space Odyssey.** Its purpose is to produce the intricate and colorful displays "behind" the game action on the screen. The board acts as a self-contained color display system that generates a pre-programmed pattern on the screen; the display it produces is simply scrolled, or moved sideways, along with the game action. All the character information is stored in the board's EPROMs, and the data from them is loaded into the banks of parallel-to-serial shift registers, 74LS166s. These streams of serial data produce the RGB outputs which are tied to the RGB outputs from the G-80 VIDEO board. When no game characters are being displayed, the background video is allowed to pass to the color monitor; when the game characters are present, the background video is shut off. Of course, this action alternates fast enough that it is not noticeable on the screen.

The background generator board senses the 8 outputs of U11 (74LS374) on the video board; these signals are connected to the Background board at pins 32 through 39. When these eight lines are high, the background generation is triggered into a display mode. Other elements of this board include monitor timing circuitry (2-74LS393 counters) for horizontal and vertical signals, and flip circuitry to invert the picture for cocktail tables. In addition, decoding IC's U65 and U66 sense the G-80 address bus signals A0-A7 to enable the circuits of the Background Generator.

e) Sound Board

The **Space Odyssey** G-80 Sound Board contains the circuits needed to generate all game sounds other than the speech. The Sound Board circuits are triggered through latches IC43 and IC44 which are connected to the data bus. The appropriate 8-bit code on the data bus is latched by IC43 or IC44 to activate the corresponding sound circuit. All sound board signals are mixed by IC 7 and output at Pin 8. The final audio output is brought into the power supply amplifier.

2. Power Supply

The Game Power Supply (800-0128) incorporates all of the voltages and audio power amplification necessary to power **Space Odyssey.** In addition to the logic supply voltages available, 100 VAC and 115 VAC isolated supplies are available for the TV monitor and fluorescent lights. Also, multiple primary taps are available for using 100 VAC, 115 VAC, or 230 VAC as the input voltage.

This supply was originally designed for use with the Dual Game Board or Dual Game VIC Board. Table 1 lists the ratings of the supply when all outputs are used simultaneously. This also happens to be a standard test load. These are worst case ratings (such as when the PROMS in use draw their maximum rated currents) and therefore are rarely encountered when driving the boards.

TABLE 1

+5V@	2A	=	10W
—5v@	1A	=	5W
+12V@	1.5A	=	18W
—12V@	1A	=	12W
MONITOR & LIGHT			
100VAC or 115 VAC			75W
TOTAL			120W

The rating of the +5V supply can be safely increased to 3.5 amps if the load currents on the other voltages are reduced. This is necessary to prevent the heat sink and transformer temperatures from increasing to the point where reliability suffers.

a) Circuit Description: The +5 volt supply consists mainly of U1 and Q5. U1 is a 723 voltage regulator IC, which contains a voltage reference, error amplifier, series pass Darlington transistor pair and a current limit transistor. Potentiometer R5 (+5V ADJ) divides the 7.15V (nominal) reference to 5.0 volts as the input to pin 5, the non-inverting input of the 723's error amp. Pin 4, the inverting input, senses the output voltage. The internal error amp maintains a voltage at U1 pin 10 which is higher than the 5.0 V output by an amount equal to the two VBE drops of Darlington Q5, which acts as a current amplifier, and the IR drop across R32.

A foldback current limiter circuit is composed of R32, R2, R3, Q1 and the internal current limit transistor of U1. This circuit allows the regulator to operate normally until the load current increases to the point where the voltage across R32 reaches the value which starts "turning on" the internal current limit transistor reduces the output current of the regulator to a fraction of the "knee" current when the output is shorted to ground. This feature greatly reduces the power dissipated in Q5 when the output is accidently short circuited. This action occurs so quickly during a short that fuse F1 should not blow. The value of the "knee" current can be increased or decreased by decreasing or increasing R3, respectively. Capacitors C4 and C5 frequency compensate the regulator so it won't oscillate, and C1 and C26 perform high frequency bypassing. Q1 is included for temperature compensation. Temperature variations of its emitter-base voltage closely match and cancel the base-emitter voltage of the internal current limit transistor. Therefore, the "knee" current of this regulator of about 6 amps stays quite constant over wide temperature variations. The short circuit current is less than 100 ma. The +12 volt regulator uses 7.15 volts as a reference. U2 compares this voltage with the voltage at the wiper of R23 (+12V ADJ). Darlington PNP Q6 is the series pass element: Transistor Q2 and current sense resistor R12 from the current limit

circuit to protect Q6 from excessive load currents. The trip point is about 3 amps. Resistor R10 shuts the circuit off even harder if the output is short circuited. Resistor R11 and electrolytic C7 form a low pass filter which prevents short current pulses from activating the current limit circuit. The —5V and —12V regulators utilize three terminal ICs, 7905 and 7912, respectively. Capacitors C2, C3, C11 and C14 bypass high frequencies so that U4 and U5 won't oscillate.

The audio power amplifier is composed of op-amp U3 and transistors Q3, Q4, Q7 and Q8. U3 provides most of the voltage gain while the transistors supply most of the current gain. This amplifier differs from previous ones in that the output stage also exhibits a voltage gain of about 2 so that the output can swing close to both power supply rails. This allows this amplifier to supply 36 watts into 4 ohms and 24 watts into 8 ohms. These values will be less in the +12 volt or —12 volt supplies are loaded significantly and/or the line voltage is less than 115 VAC. The overall voltage gain of the circuit is set by the ratio of R20 and R28. The actual value is:

$$\frac{R20}{R28}+1=\frac{47K}{2.2K}+1 = 22.4 \text{ or } 27 \text{ db}$$

Capacitor C13 determines the low frequency roll off (about 7 HZ) and forces the DC gain to be unity. Therefore, the circuit does not amplify DC voltage. The input impedance is 47k ohms and is direct coupled.

b) Adjustments:

i. Adjust R5 for 5.0V at the load. This compensates for wiring losses.

ii. Adjust R23 for 12.0V at the load.

iii. There are no adjustments for the —5V or —12V supplies or for the amplifier. The values should be —5V ±0.2V and —12V ±0.5V.

The second power supply, the switching regulator, is an efficient device that provides a regulated +5 voltage at a high current. A power transformer and circuit could do the same thing, but it is much less efficient. The following theory refers to the switching regulator part #601-0158; the schematic is included in the back of the manual.

Basically, a switching regulator operates by switching a high voltage, low current input through an inductor and filter capacitor. The current through the inductor rises when the high voltage is applied. When the voltage is cut off, the falling current level is then switched again through the capacitor. The resulting output, which is dependent on the on-off periods of the switching action, is a regulated voltage much lower than the input voltage but at a higher current.

Looking at the schematic, we see the 110 volt AC input applied to bridge rectifier D1. The filtered DC output is switched on and off through inductor T1 by transistor Q1. Transformer T1 is a step down type; its secondary output voltage then, is considerably less than the primary voltage. As the primary voltage is switched, the secondary current alternates through L1. When the current through L1 falls negative, D3 switches on to pass the current to the filter capacitors, C9 and C10. The action occurs rapidly, and gives a 5 volt DC output. The 5 volt output is sensed by ICI which causes the pulse (switching) rate to vary and provides output voltage regulation. The pulsing output of IC1 switches transistor Q2 on and off which, in turn, switches transformer T2. The output of T2 is then applied to Q1. Transformer T2 is necessary to isolate the output side of the supply from the input side. Transformer T3 supplies the necessary DC voltages for the IC and its associated circuit. R2, C2, C3, C5, R4 and D2 serve as suppressors to absorb the switching spikes.

maintenance procedures

1. Self-Test

Space Odyssey contains a built-in self-test system, activated by depressing the red self-test switch located on the CPU board. If the cover to the G-80 card cage is in place, the switch can be activated by putting a pen or pencil through the hole provided on the cover. See figure 5.

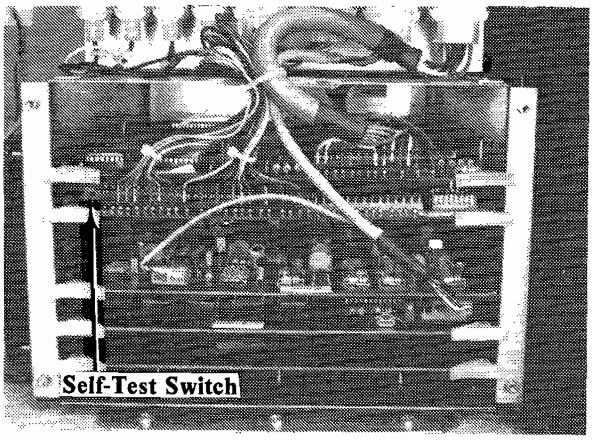
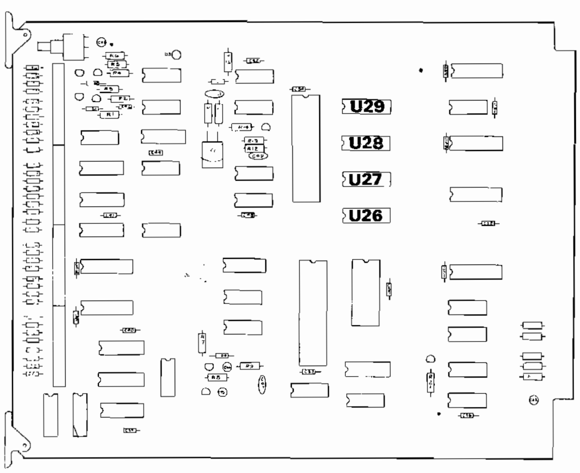


Figure 5

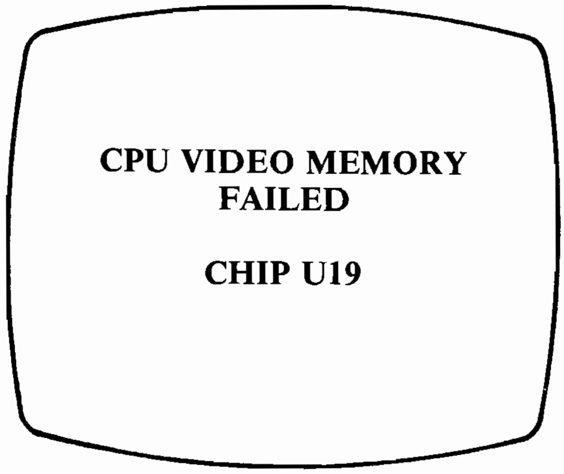
a) CPU Board RAM Test

The first test performed is a CPU Board RAM test, for IC's U26-U29. It is instantaneous and ends when the screen goes white. If there is a problem in the CPU Board, the test will not continue, and you must use standard troubleshooting techniques to isolate and repair the CPU Board. There is a red LED, called the Halt Light, located directly behind the self-test switch. When a problem on the CPU Board occurs, it will come on and remain lit.

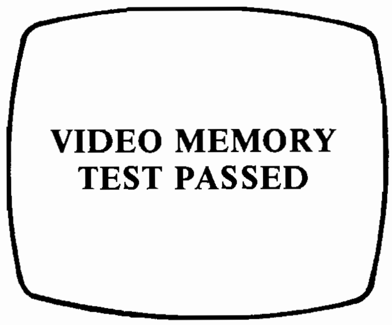


b) Video RAM Test

The white screen is the beginning of the Video RAM test. If there is a problem, the screen displays:



It tells you exactly which chip is defective. The rest of the test will not continue until the faulty RAM is repaired. If the video RAMs are functioning properly, the screen displays:



c) Input Test

The next sequence tests for errors in the input circuitry. The screen display is on the next page. INT in the upper left corner of the screen tests the interrupt circuits to the CPU. To be working properly, random characters should be displayed very rapidly to the right of INT. This shows the interrupt circuits are functioning properly. If the space to the right of INT remains blank, the CPU is not being interrupted properly. Dip Switch settings are displayed to verify the options selection. 1PSTART and 2PSTART will not be displayed on the screen initially. Depress the 1-player and 2-player buttons alternately and they should appear on the screen. If not, then there is a problem in the circuitry associated with the 1 and 2 player buttons. The bottom of the screen displays Player Controls. To be functioning correctly, they should all display OFF, then as each switch is depressed, display ON.

INPUT TEST									
INT	DIP SWITCHES								
	8	7	6	5	4	3	2	1	
1	0	0	0	0	0	0	0	0	
2	C	C	0	0	0	0	0	0	

1PSTART		2PSTART		
PLAYER CONTROLS				
P1	UP			OFF
P1	Right	P1	Right	OFF
P1	Down	P1	Down	OFF
P1	Left	P1	Left	OFF
P1	Fire	P2	Left	OFF
P1	Bomb	P2	Up	OFF
		P1	Up	OFF
		P1	Fire	OFF
		P1	Bomb	OFF

d) Coin Test

This test checks the timing of the coin switch. Refer to the illustration below. To activate this test, insert coins into both coin mechs alternately. Coin mech 1 will appear on the screen as A and coin mech 2 will be displayed as B. Any letter appearing within the good area indicates the coin switches are timed properly. The closer the letter comes to either line, though, the more out of adjustment the coin switches are. Adjust a faulty coin switch by bending the trip wire up or down, slightly. To proceed to the next test, the 1-player button must be depressed.

COIN TEST		
BAD	GOOD	BAD
	A A B B	

e) Eprom Test

This test checks the EPROMS on the EPROM Board. Note the display above. The part number for each Eprom is displayed and whether that EPROM is good or bad. This is a fast test and will not remain on the screen long if none of the PROMs are bad.

EPROM TEST	
0941B	Good
0942A	Good
0943A	Good
0944A	Good
0945A	Good
0946A	Good
0947A	Good
0948A	Good
0949A	Good
0950	Good
0951A	Good
0952	Good
0953	Good
0954	Good
0955A	Good
0956	Good
0957A	Good
0958A	Good
*****	None
*****	None
*****	None
*****	None
*****	None

f) Screen Test

This is a color test. You will see a white line around the entire screen and across the middle to divide the screen in half. In the upper half will be three color bars. The top one is blue, the middle is green and the bottom should be red. This test can be terminated by depressing the 1-player button.

g) Sound Test

The final phase displays each type of sound on the screen accompanied by the actual audio sound. It starts with display, ALL SOUNDS OFF, and continues through eleven different sounds.

At the conclusion of the sound test, the game displays:

The game then returns to the advertising sequence and the test is complete.

2. Control Panel Removal

With the door to the game electronics compartment open, reach under the control panel and flip the fasteners on both sides of the control panel. The control panel will now swing down as shown in figure 6. Disconnect the control panel connector. Now slide the spring-loaded pins on both sides to take out the control panel.

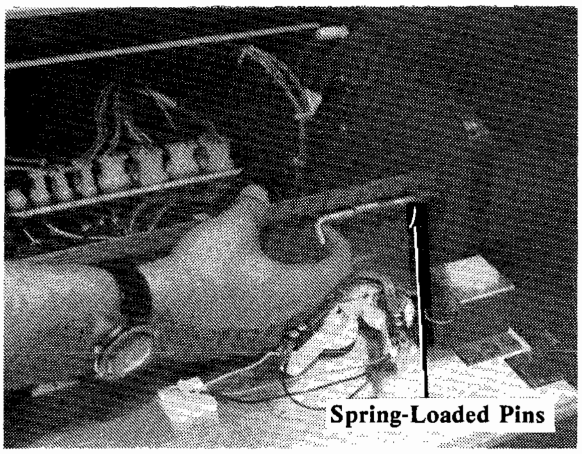


Figure 6

3. Front Bezel, Interior Graphics and Spacer Frame Removal

The front bezel, which secures the interior graphics, is held in place by the control panel. Refer to figure 7. Unhook the fasteners on the control panel and swing it down. The front bezel can now be removed easily by lifting it on the bottom slightly and pulling it outward. Note that at the top of the bezel frame, there are two small pins to hold and align the bezel. The interior graphics can now be removed. Figure 7 also details the spacer frame which is located directly behind the interior graphics. It must be removed when taking out the monitor or replacing the panel logo. To remove the spacer frame simply pull on the four sides carefully and lift it out.

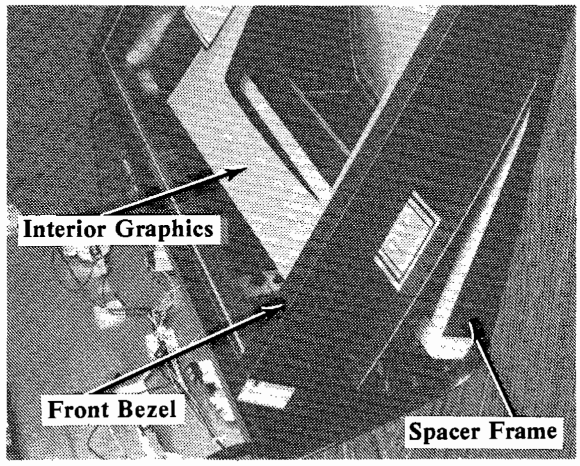


Figure 7

4. Card Cage Removal

If it is necessary to remove the card cage for servicing, first disconnect all the connectors. Then remove the three mounting screws shown in figure 8 and the card cage can be slipped from the mounting bracket underneath the cage.

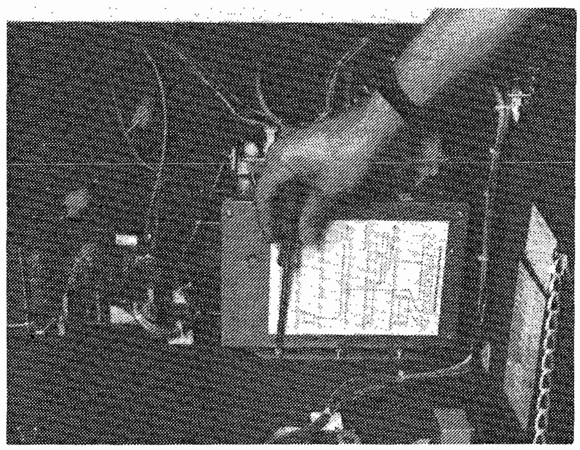


Figure 8

5. Panel Logo Removal

First remove the front bezel, interior graphics and spacer frame as explained

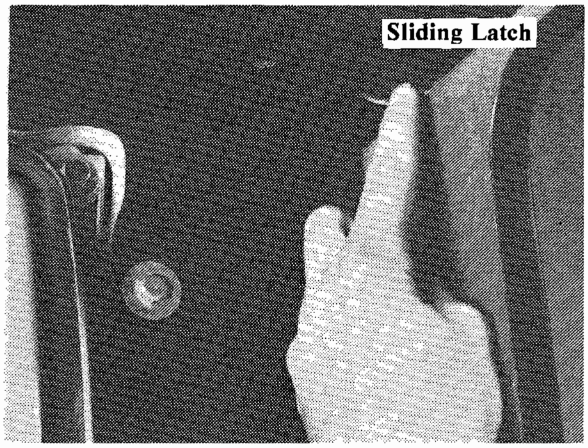


Figure 9

previously. Underneath the panel logo and on either side of the speaker board you will see a sliding latch. Refer to figure 9. Using a screwdriver or your finger slide the latches on both sides to release the speaker swing panel. Push up on this panel to release the panel logo from its mounting slots. Refer to figure 10. With the panel logo removed, easy access is gained to the speaker and fluorescent lamp assemblies for servicing. To install the panel logo, release the two latches on the speaker swing panel, push the back of the board up and insert the lower edge of the panel logo in its slot. Then, push the front edge of the speaker swing panel up and, at the same time, push the panel logo in to seat the upper edge of the logo into its top slot. Once in place, close the latches to secure the speaker swing panel.

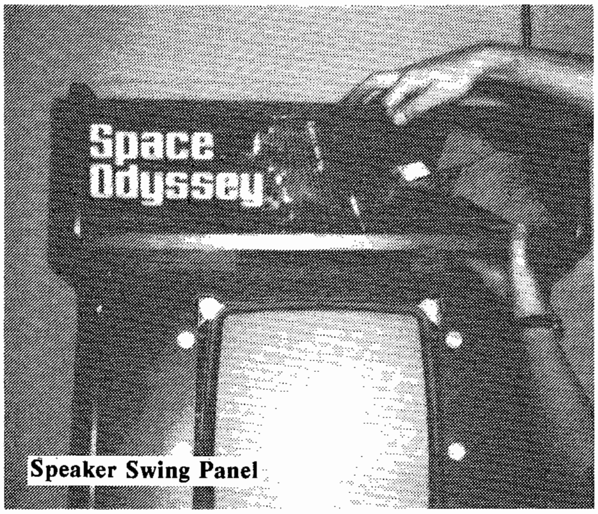


Figure 10

6. Monitor Removal

To remove the monitor for servicing or replacement, first open the back panel on the cabinet and disconnect the leads to the monitor. Then, remove the front bezel, interior graphics and spacer frame as explained earlier. Underneath the monitor in the game electronics compartment are four bolts securing the monitor in place. Refer to figure 11. Remove these, pull the monitor on either side and slide it out carefully.

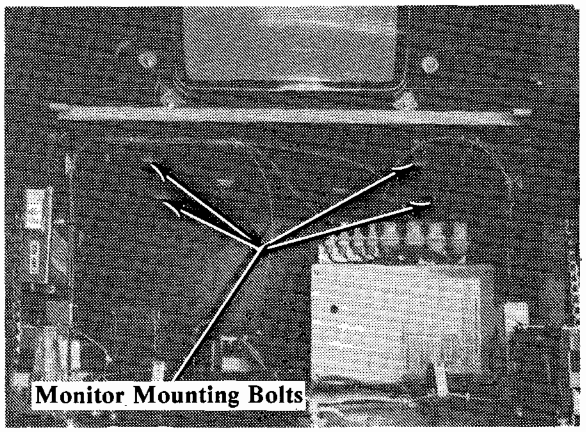


Figure 11

game adjustments

1. Operator Panel

The operator panel is located on the inside of the coin door behind the coin mechanism. It contains the volume control for adjusting sound, a service switch for giving credits without increasing the coin counter and a reset switch for resetting the game.

2. Options Selection

The following charts define the game and coin/credit options available for the **Space Odyssey** game. These options are controlled by 2 sets of switches (DIP) located in the upper left hand corner of the G-80 CPU card. Switch #1 is positioned close to the edge of the board; switch #2 is recessed.

SPACE ODYSSEY GAME OPTIONS — Switch #1

Game Option	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
6 Ships	0	0	X	X	X	X	X	0
5 Ships	0	C	X	X	X	X	X	0
4 Ships	C	0	X	X	X	X	X	0
3 Ships	C	C	X	X	X	X	X	0
Extra Ship @								
80,000 PTS	X	X	X	0	0	X	X	0
60,000 PTS	X	X	X	0	C	X	X	0
40,000 PTS	X	X	X	C	0	X	X	0
20,000 PTS	X	X	X	C	C	X	X	0
UPRIGHT	X	X	0	X	X	X	X	0
COCKTAIL	X	X	C	X	X	X	X	0

COIN/CREDIT OPTIONS — Switch #2

Coin/Credit	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
4 coin/1 credit	C	C	C	C	C	C	C	C
3 coin/1 credit	O	C	C	C	O	C	C	C
2 coin/1 credit	C	O	C	C	C	O	C	C
1 coin/1 credit	O	O	C	C	O	O	C	C
1 coin/2 credit	C	C	O	C	C	C	O	C
1 coin/3 credit	O	C	O	C	O	C	O	C
1 coin/4 credit	C	O	O	C	C	O	O	C
1 coin/5 credit	O	O	O	C	O	O	O	C
1 coin/6 credit	C	C	C	O	C	C	C	O
2 coin/1 credit 4 coin/2 credit 5 coin/3 credit	O	C	C	O	O	C	C	O

COIN/CREDIT OPTIONS — Switch #2, Continued

Coin/Credit	8	7	6	5	4	3	2	1
2 coin/1 credit 4 coin/3 credit	C	O	C	O	C	O	C	O
1 coin/1 credit 2 coin/2 credit 3 coin/3 credit 4 coin/4 credit 5 coin/6 credit	O	O	C	O	O	O	C	O
1 coin/1 credit 2 coin/2 credit 3 coin/3 credit 4 coin/5 credit	C	C	O	O	C	C	O	O
1 coin/1 credit 2 coin/3 credit	O	C	O	O	O	C	O	O
1 coin/2 credit 2 coin/4 credit 3 coin/6 credit 4 coin/8 credit 5 coin/11 credit	C	O	O	O	C	O	O	O
1 coin/2 credit 2 coin/4 credit 3 coin/6 credit 4 coin/9 credit	O	O	O	O	O	O	O	O

X = Don't Care O = Open C = Closed

parts catalog

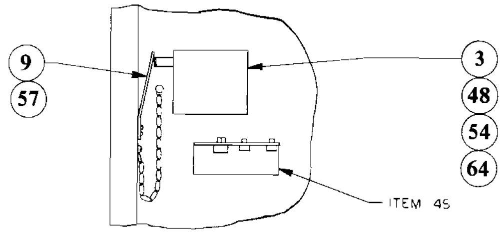
top assembly

[10] Indicates Recommended Spare Parts—Stock Quantity Indicated To Support 5 Games.

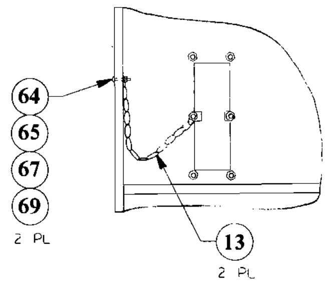
PARTS LIST — **DWG NO. 700-0056**

Spare	Item #	Gremlin Part #	Qty Per Assembly	Description
1	1	130-0001	1	SPEAKER GAME 6x9
1	2	130-0002	1	SPEAKER COVER 6x9
	3	140-0021	1	COVER J-BOX
	4	140-0054	1	CABINET, UPRIGHT K-D
	5	220-0019	1	LOCK, PANEL
	6	220-0160	2	COIN MECH.
	7	220-0167	2	LOCK,COINMECH.DOOR
	8	220-0178	2	DRAW LATCH
	9	250-0038	1	MOLDING STRIP
	10	250-0048	1	CLIP SWITCH
	11	250-0452	1	TEE MOLDING
	12	250-0453	1	LIP MOLDING
	13	250-0458	1	SADDLE G-80 CAGE
	14	250-0467	2	COIN DOOR SUPPORT
	15	250-0481	1	STRIKE PLATE
	16	253-0201	2	COVER, HAND HOLD
	17	253-0202	1	COVER, POWER CORD
1	18	253-0203	1	PANEL MONITOR K-D
	19	253-0212	2	CASH BOX MODIFIED
1	20	253-0219	1	PANEL LOGO S/O
	21	280-0005	30	CABLE TIE
	22	280-0324	2	CABLE CLAMP NYLON
	23	280-0327	25	BASE TIE WRAP
	24	280-0360	3	WASHER LOCK, LOCK
	25	390-0019	1	LAMP FLUORESCENT
	26	420-0028	1	DECAL S/N
	27	420-0030	1	DECAL CAUTION
	28	420-0041	1	DECAL S/N SMALL
	29	420-0486	1	MANUAL ELECTROHOME MON.
	30	420-0568	1	DECAL FCC
1	31	420-0609	1	GRAPHIC INTERIOR S/O
1	32	420-0610	1	MANUAL SPACE ODYSSEY
	33	420-0611	1	DECAL GAME INSTRUCTIONS
	34	800-0147	1	ASSY. FLUORESCENT LAMP 2
1	35	800-0165	1	ASSY. MONITOR COLOR
	36	800-0175	1	ASSY. VOL. CONTROL BLOCK
	37	800-0179	1	ASSY. COIN COUNTER
	38	800-0196	1	ASSY. HARNESS VIDEO
	39	800-0217	1	ASSY. HARNESS SPEAKER
	40	800-0230	1	ASSY. HARN. CONT. PNL. INTERFACE
	41	800-0231	1	ASSY. HARN. GRND. COIN MECH.

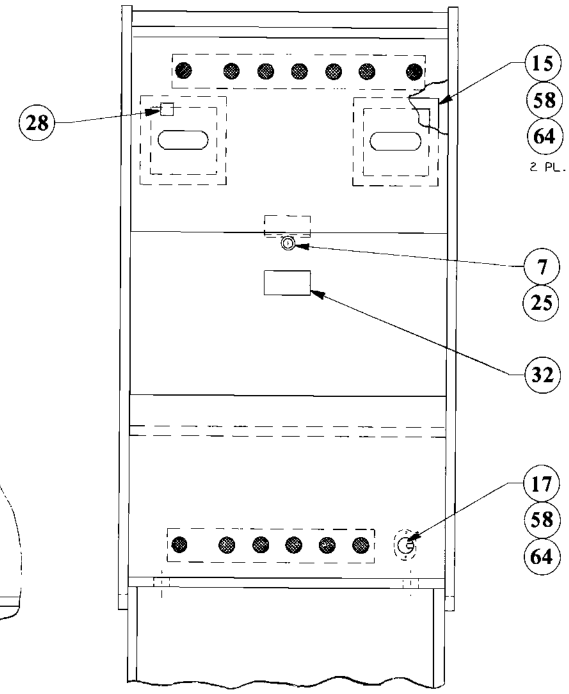
Top Assembly
700-0056



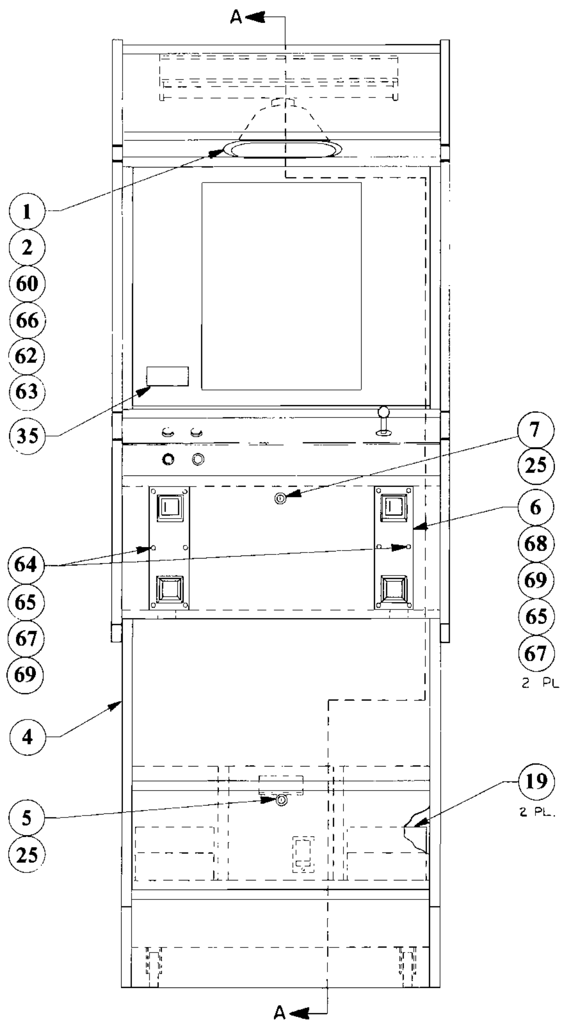
SECTION C-C
N.T.S.



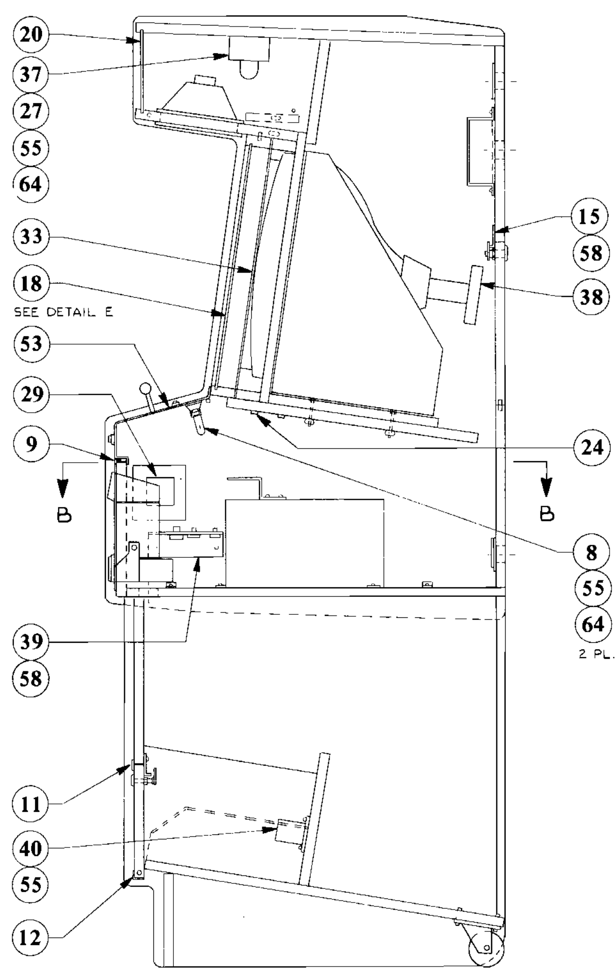
SECTION E-E
ROTATED 90° CW
2 PL



REAR VIEW



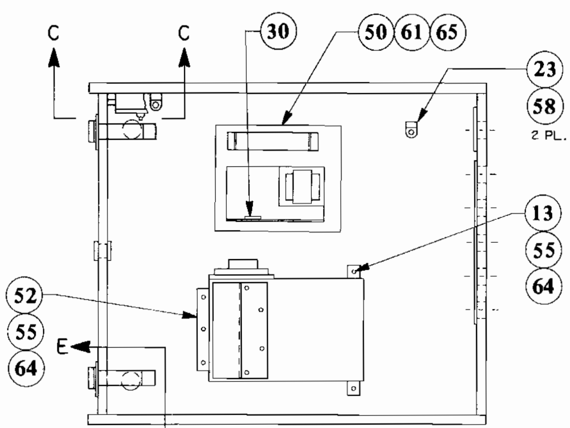
FRONT VIEW



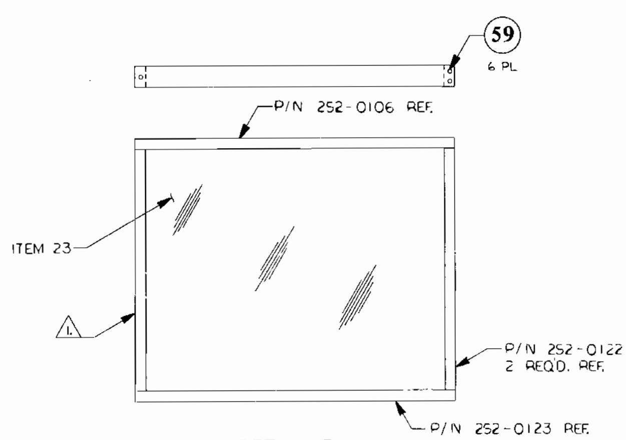
SECTION A-A

Top Assembly—Continued

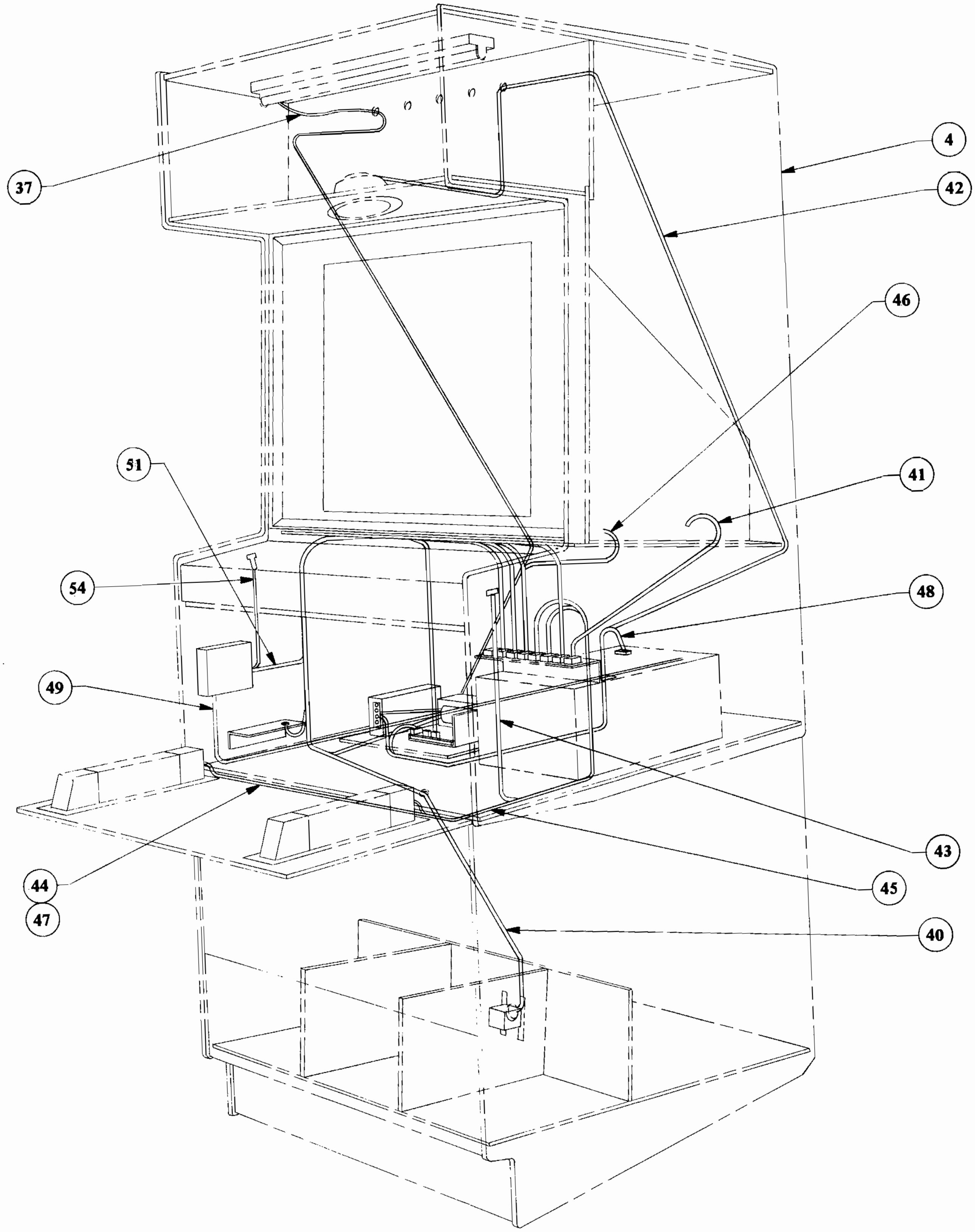
PARTS LIST			DWG NO. 700-0056
Item #	Gremlin Part #	Qty Per Assembly	Description
42	800-0232	1	ASSY. HARN. GRND. INTERFACE
43	800-0234	1	ASSY. HARNESS MON. GRND.
44	800-0236	1	ASSY. HARNESS COIN MECH.
45	800-0268	1	ASSY. HARN POWER
46	800-0269	1	ASSY. J-BOX
47	800-0270	1	ASSY. PWR. SUPPLY
48	800-0271	1	ASSY. HARN. GRND. SWITCHER
49	800-3161	1	ASSY. GAME ELECTRONICS S/O
50	800-3165	1	ASSY. CONTROL PANEL COMP.
51	800-0237	1	ASSY. GRND. STRAP CONT. PANEL
52		15	SCR PHIL PAN HD. #7x.75 PART BD.
53		2	SCR PHIL PAN HD 8x.62 SHT. MTL.
54		17	SCR PHIL PAN HD #10x.5 SHT. MTL.
55		6	SCR BUGLE HD. #7x1.5
56		4	SCR SLOT HD. #8-32x1.5 MACH.
57		4	SCR PHIL PAN HD. #10x1.25 SHT. MTL.
58		6	WASHER FLAT #8
59		4	WASHER LOCK SPLIT #8
60		37	WASHER FLAT #10
61		18	WASHER LOCK SPLT #10
62		4	NUT HEX #8-32
63		14	NUT HEX #10-24
64		10	BOLT CARRIAGE #10-24x1 ¼
65		4	BOLT CARRIAGE #10-24x1.5 L.



SECTION B-B



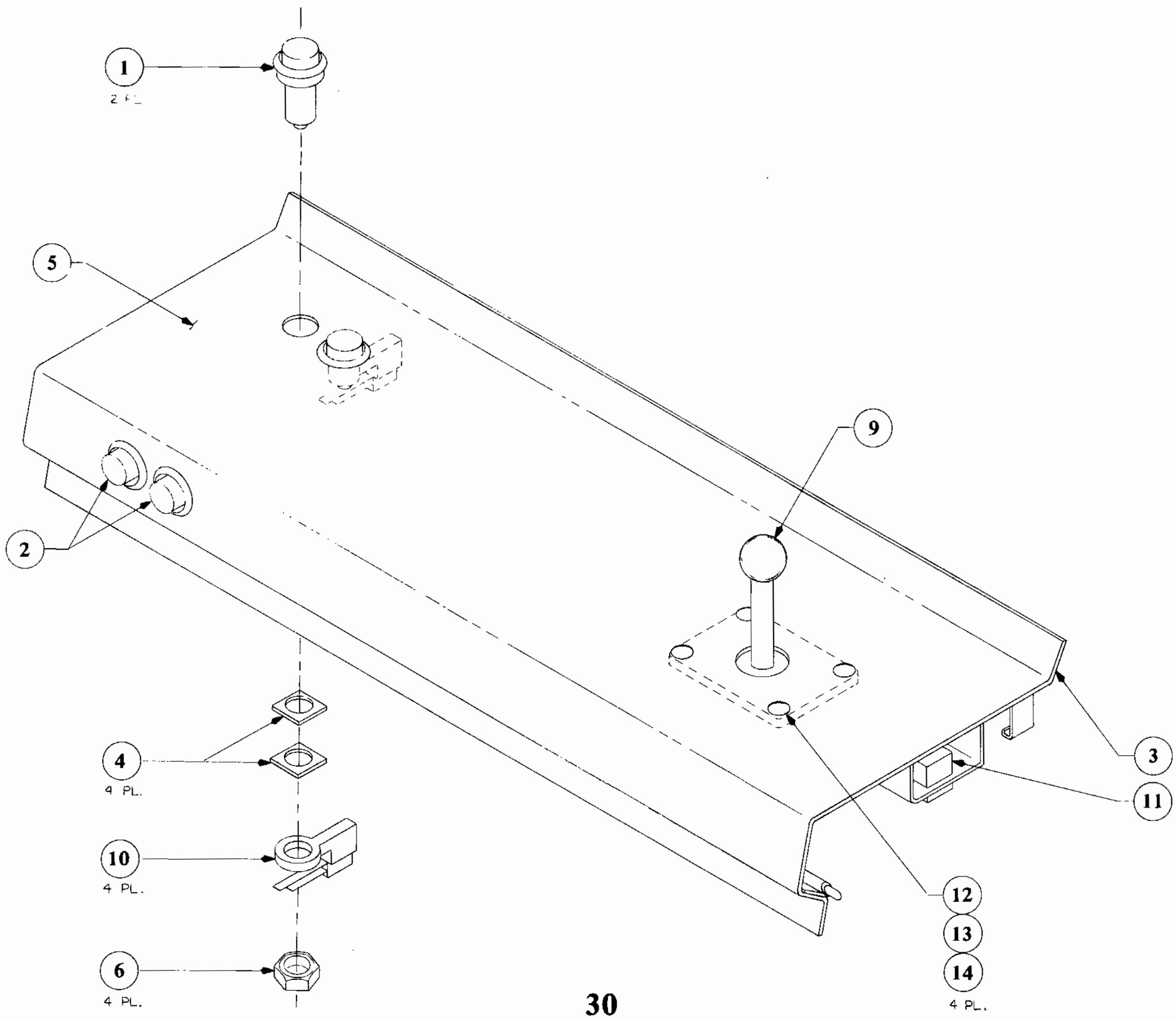
DETAIL E



Top Assembly
700-0056

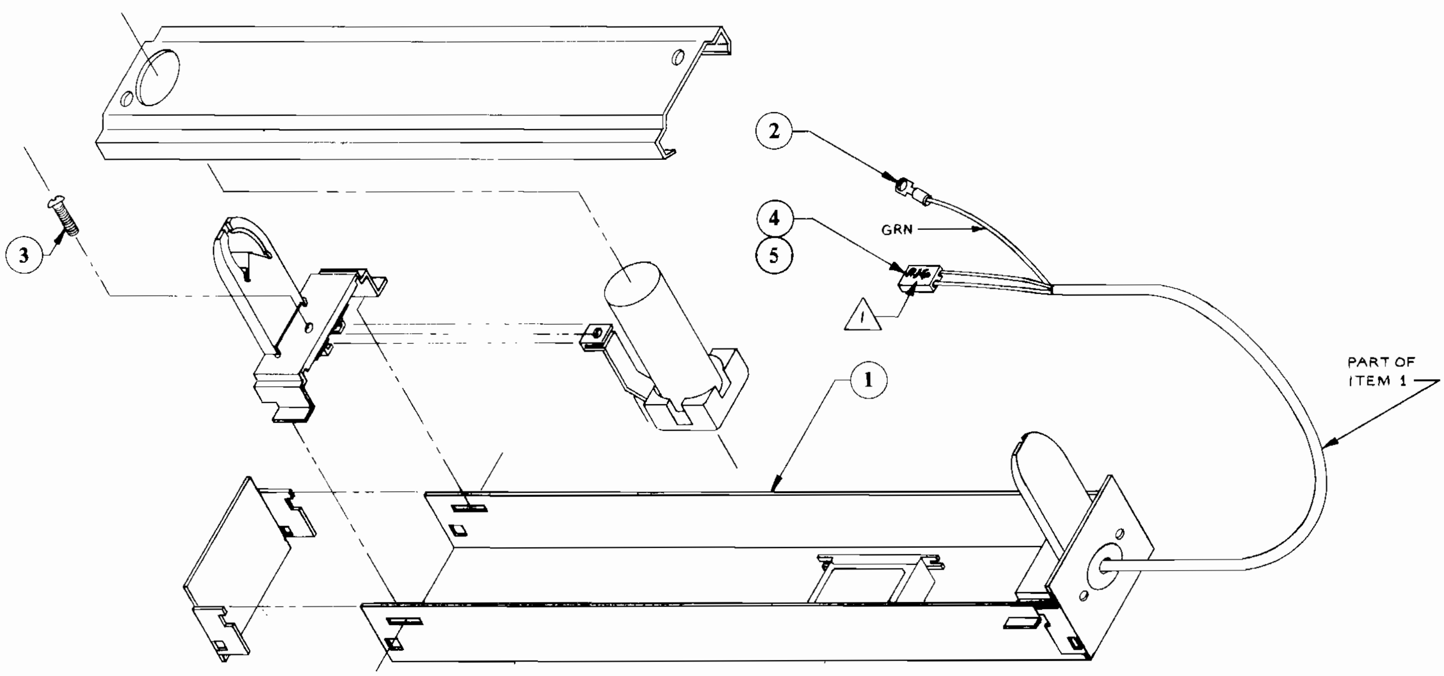
control panel assembly

PARTS LIST				DWG NO. 800-3165
	Item #	Gremlin Part #	Qty Per Assembly	Description
2	1	240-0006	2	BUTTON PLUNGER RED
2	2	240-0007	2	BUTTON PLUNGER, BLK.
	3	250-0489	1	SUBPANEL METAL WELDMENT 5/O
	4	253-0031	8	SPACER, SWITCH
1	5	253-0220	1	GRAPHIC CONTROL PANEL
	6	280-0329	4	NUT, HEX PAL ½-13
	7	280-0327	3	BASE TIE WRAP
	8	280-0005	A/R	CABLE TIE
1	9	510-0058	1	JOYSTICK 8 WAY LONG SHAFT
4	10	510-0023	4	ASSY. SWITCH
	11	800-3166	1	ASSY. HARN. CONTROL PANEL
	12		4	BOLT CARRIAGE No. 10-24x.75 L.
	13		4	NUT, HEX No. 10-24
	14		4	WASHER, LOCK No. 10



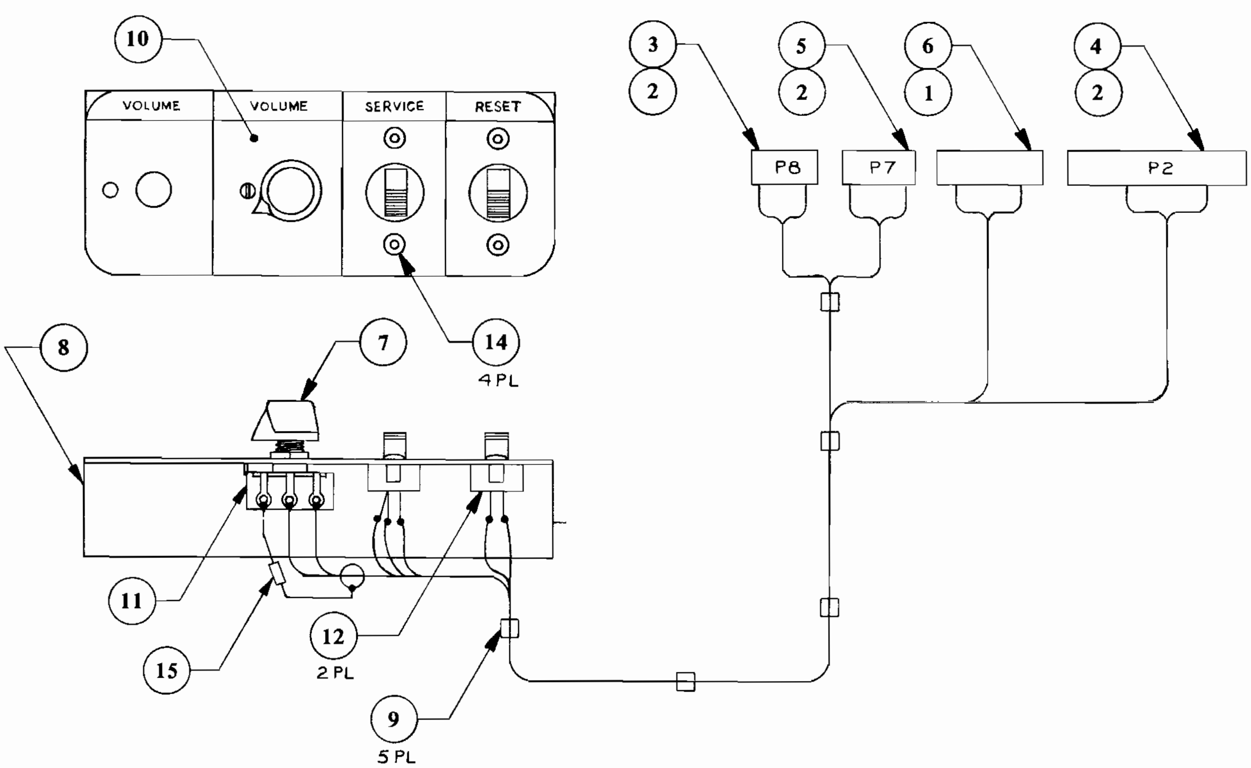
fluorescent lamp assembly

PARTS LIST			DWG NO. 800-0147
Item #	Gremlin Part #	Qty Per Assembly	Description
1	390-0083	1	LAMP FIXTURE FLUOR 18"
2	211-0027	1	CONN. RING LUG #10
3		1	6-32x½" ROUND OR PN HD MACH. SCREW
4	211-0044	1	CONN CAP AMP 2 PIN
5	211-0041	2	CONN PIN AMP

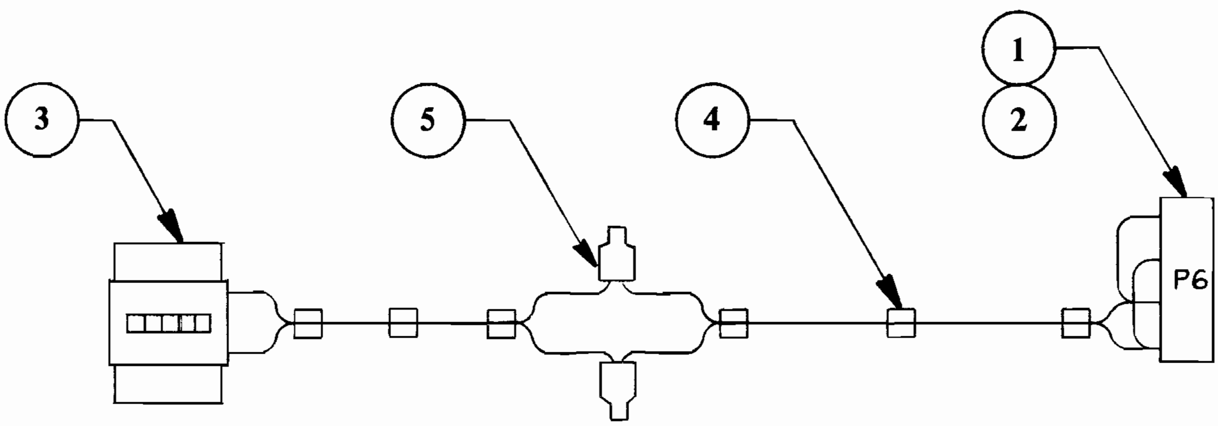


volume control block assembly

	PARTS LIST			DWG NO. 800-0175
	Item #	**Gremlin Part #**	**Qty Per Assembly**	**Description**
	1	211-0005	2	CONN CRIMP LOCK
	2	211-0042	7	CONN SOCKET AMP
	3	211-0043	1	CONN PLUG AMP 2 PIN
	4	211-0045	1	CONN PLUG AMP 6 PIN
	5	211-0059	1	CONN PLUG AMP 3 PIN
	6	212-0005	1	CONN FEM BLK 4 PIN
1	7	240-0001	1	KNOB VOL CONT
	8	250-0462	1	VOL CONT BRKT
	9	280-0005	12	CABLE TIE
	10	420-0561	1	DECAL OPERATOR CONTROL
1	11	475-0007	1	POT 10K CAR PNL MT
2	12	510-0051	2	SW PUSHBUTTON SLIDE
	13	600-0013	6FT	CABLE 1 COND SHLD
	14		4	POP RIVET ⅛x¼"
	15	470-0331	1	RESISTOR 330 OHM ¼W 5%

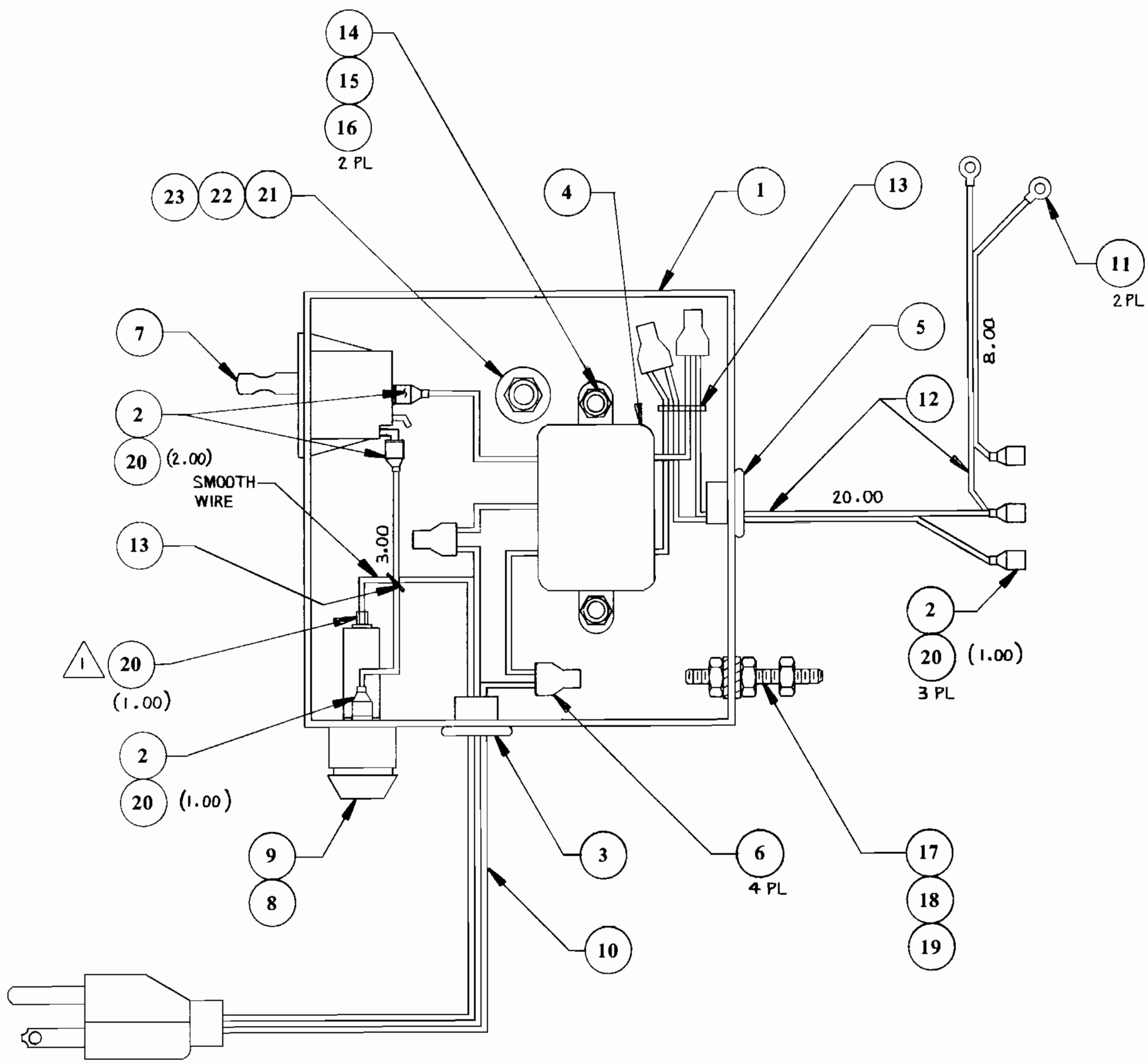


PARTS LIST			DWG NO. 800-0179
Item #	Gremlin Part #	Qty Per Assembly	Description
1	211-0042	4	CONN SOCKET AMP
2	211-0073	1	CONN AMP PLUG 4 PIN
3	220-0008	1	COUNTER DIGITAL 6 VOLTS
4	280-0005	8	CABLE TIE
5	280-0362	2	ELECTRIC CRIMP SLEEVE 24-18 AWG.



junction box assembly

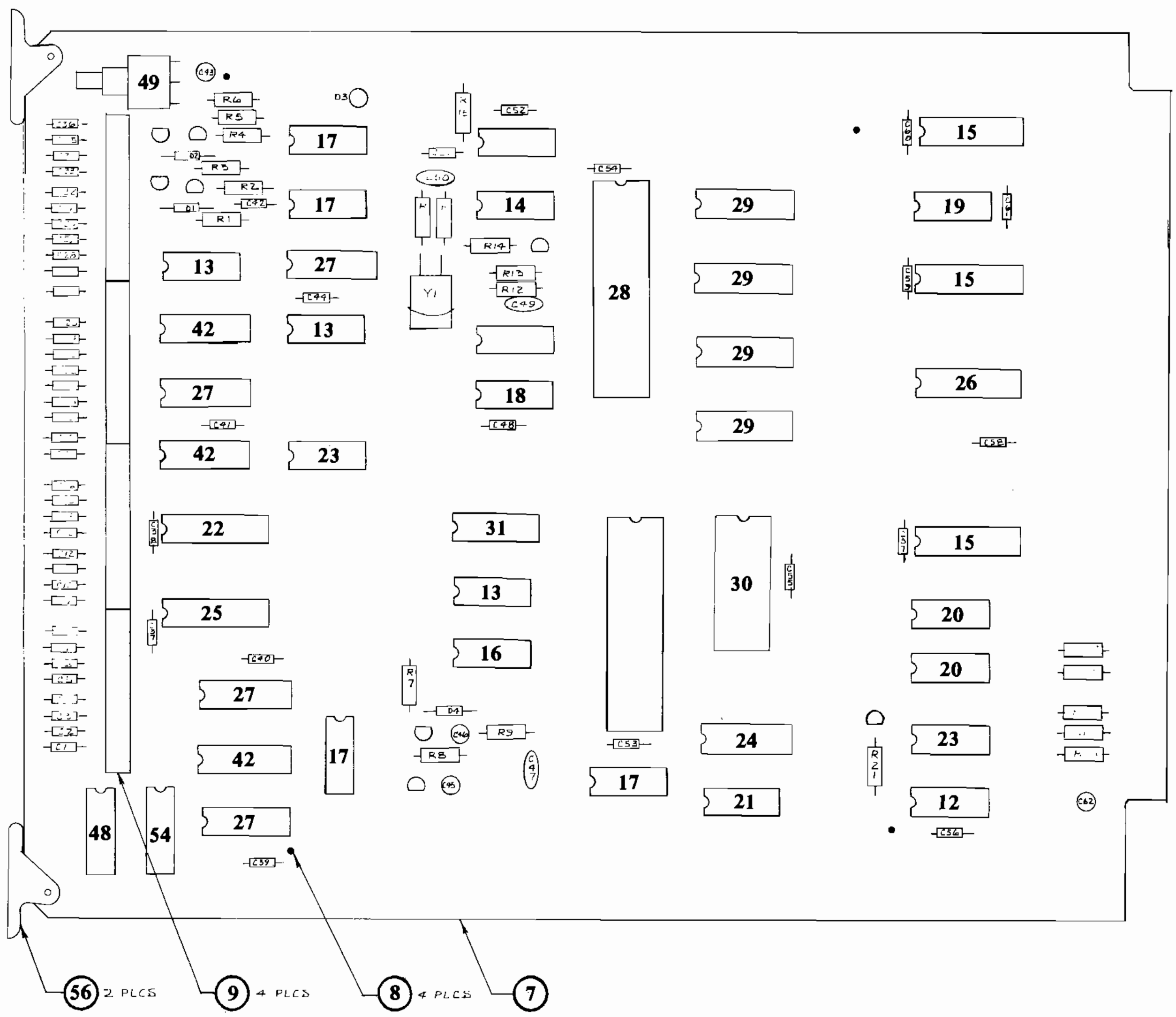
	PARTS LIST			DWG NO. 800-0269
	Item #	Gremlin Part #	Qty Per Assembly	Description
	1	140-0020	1	JUNCTION BOX METAL
	2	211-0038	6	CONN QUICK 3/16 FEM.
	3	280-0361	1	BUSHING S/REL A.C. CORD
1	4	270-0001	1	FILTER EMI
	5	280-0007	1	BUSHING S/REL ½
	6	280-0362	4	ELECTRIC CRIMP SLEEVE 24-18 AWG
1	7	510-0013	1	SWITCH SPDT CHERRY
1	8	514-0001	1	FUSE 2 AMP 250V S.B.
	9	514-0005	1	HOLDER FUSE
	10	600-0001	1	CORD LINE 3 COND.
	11	211-0027	2	CONN RING LUG #10
	12	600-0079	2.3 FT.	CORD LINE ZIP
	13	280-0005	2	CABLE TIE
	14		2	SCREW 6-32x5/8
	15		2	NUT HEX. HD. 6-32
	16		2	WASHER, LOCK #6 INT. STAR
	17		1	STUD 8-32x1
	18		3	NUT HEX. HD. 8-32
	19		2	WASHER LOCK #8 INT. STAR
	20		.6 FT.	SHRINK TUBING - ¼ DIA
	21		1	WASHER FLAT ¼"
	22		1	NUT HEX HD #10-24
	23		1	BOLT CARRIAGE #10-24x1¾"



Junction Box Assembly
800-0269

cpu board assembly

	PARTS LIST				DWG NO. 800-0107
	Item #	**Gremlin Part #**	**Qty Per Assembly**	**Description**	**Ref Des**
	1	150-0088	4	CAP E 10uf 25V	C43, C45, C46, C62
	2	151-0005	1	CAP CER 680pf 50V	C50
	3	151-0012	1	CAP CER .1uf 50V	C47
	4	151-0020	1	CAP CER 33pf 50V	C49
	5	151-0060	21	CAP CER .1uf 16V AX	C37-C42, C44, C48 C51-C61, C63, C64
	6	151-0061	36	CAP CER 220pf 16VAX	C1-C36
	7	170-0194	1	PC. BOARD	
	8	211-0008	4	CONN PIN TEST PT	TP1-TP4
	9	212-0098	4	CONN M 10 PIN RTA	
1	10	230-0013	1	XTAL 8.000 MHZ	
	11	314-0001	1	IC NE555	U12
	12	314-0015	1	IC 7404	U30
	13	314-0018	4	IC 74LS00	U6, U8, U14, U19
	14	314-0019	1	IC 74LS04	U18
	15	314-0058			
	15	314-0055	3	IC 74LS244	U34, U36, U38
	16	314-0058	1	IC 74LS08	U13
	17	314-0062	5	IC 74LS74	U10, U11, U17, U20, U39
	18	314-0066	1	IC 74LS27	U16
	19	314-0067	1	IC 74LS30	U37
	20	314-0068	2	IC 74LS32	U32, U33
	21	314-0078	1	IC 74LS02	U23
	22	314-0083	1	IC 74LS240	U4
	23	314-0085	2	IC 74LS14	U7, U31
	24	314-0087	1	IC 74LS139	U24
	25	314-0093	1	IC 74LS374	U3
1	26	314-0099	1	IC 74LS245	U35
	27	314-0105	4	IC 74LS253	U1, U2, U5, U9



CPU Board Assembly
800-0107

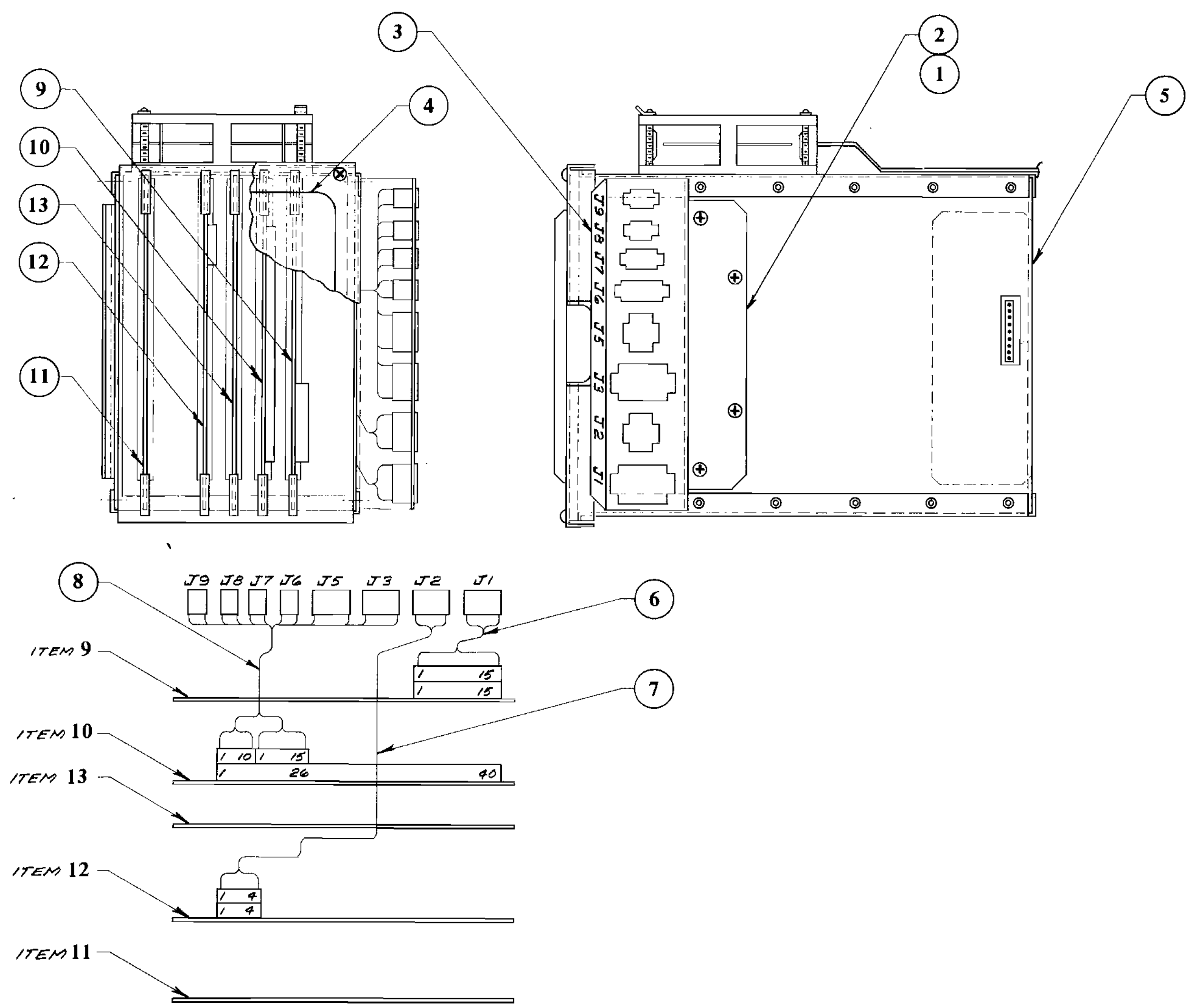
CPU Board Assembly—Continued

PARTS LIST DWG NO. 800-0107

	Item #	Gremlin Part #	Qty Per Assembly	Description	Ref Des
1	28	315-0041	1	IC Z80A	U22
4	29	315-0046	4	IC 2114	U26 - U29
1	30	315-0050	1	IC 2516 (2716)	U25
1	31	316-0764	1	IC PROM 32x8	U15
	32	390-0003	1	LED RED	D3
	33	471-0101	1	RES 100 OHM ½ W 5%	R5
	34	471-0102	2	RES 1K OHM ½W 5%	R1, R3
	35	471-0103	1	RES 10K OHM ½W 5%	R6
	36	471-0104	3	RES 100K OHM ½W 5%	R7, R8, R22
	37	471-0122	1	RES 1.2 K OHM ½W 5%	R12
	38	471-0220	1	RES 22 OHM ½W 5%	R14
	39	471-0221	3	RES 220 OHM ½W 5%	R2, R4, R13
	40	471-0331	8	RES 330 OHM ½W 5%	R10, R11, R15-R20
	41	477-0002	3	RES PACK 15x2.2K	RP1-RP3
	42	481-0001	2	DIODE IN4002	D1, D2
	43	481-0006	1	DIODE IN914/IN4148	D4
	44	482-0006	1	XSTR 2N 4403	Q7
2	45	482-0010	2	XSTR PE 8050	Q1 Q2
	46	482-0014	5	XSTR 2N4401	Q3-Q6, Q8
1	47	510-0052	1	SWITCH PIANO DIP.	SW1
1	48	510-0053	1	SW PUSHBUTTON SIDE PCM	SW3
	49	213-0001	1	SKT 24 PIN DUAL INLN	XU25
	50	213-0002	4	SKT 18 PIN DUAL INLN	XU26 - XU29
	51	213-0004	1	SKT 16 PIN DUAL INLN	XU15
	52	213-0005	2	SKT 40 PIN DUAL INLN	XU21, XU22
	53	510-0049	1	SWITCH 8 POS DIP	SW2
	54	471-0472	1	RES 4.7K OHM ½W 5%	R21
	55	280-0330	2	CARD EJECTOR	
	56	471-0473	1	RES 47K OHM ½W 5%	R9

space odyssey game electronics assembly

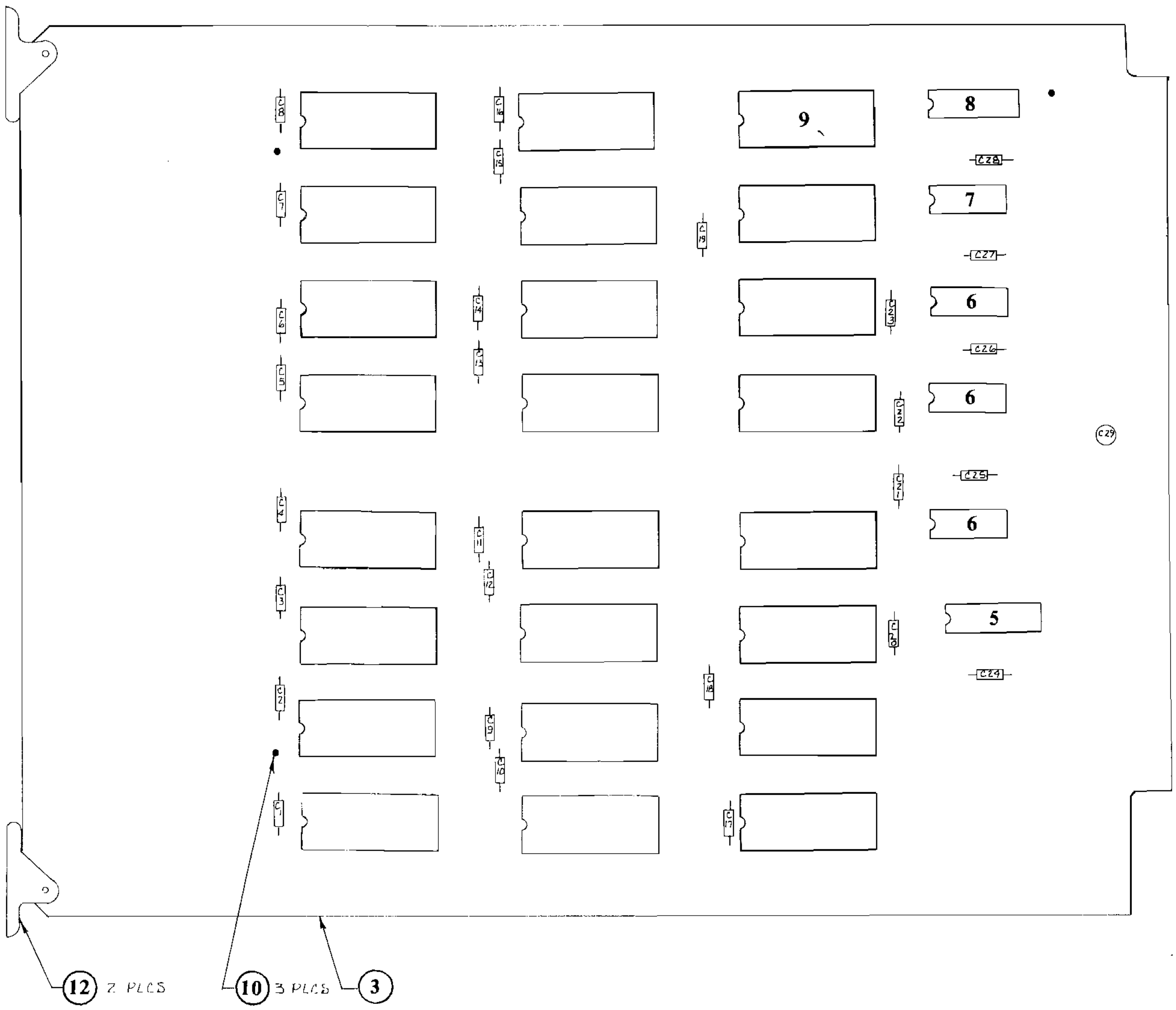
PARTS LIST			DWG NO. 800-3161
Item #	Gremlin Part #	Qty Per Assembly	Description
1		4	SCR PHIL RD #10 SHT MTL .50LG
2	250-0475	1	BRACKET, CONNECTOR
3	420-0563	1	DECAL G-80 BRACKET
4	420-0607	1	DECAL SPACE ODYSSEY ELECTRONICS
5	800-0171	1	ASSY G-80 CAGE
6	800-0173	1	ASSY HARN VIDEO
7	800-0291	1	ASSY HARN SOUND
8	800-0185	1	ASSY HARN CPU
9	800-3160	1	ASSY VIDEO I BOARD SPACE ODYSSEY
10	800-3163	1	ASSY CPU BOARD SPACE ODYSSEY
11	800-3164	1	ASSY EPROM BOARD SPACE ODYSSEY
12	834-0051	1	ASSY SOUND BOARD SPACE ODYSSEY
13	834-0053	1	ASSY BACKGROUND GENERATOR BD



eprom board assembly

PARTS LIST **DWG NO. 800-0151**

	Item #	Gremlin Part #	Qty Per Assembly	Description	Ref Des
	1	151-0058	13	CAP CER .01uf 16V AX	C2, 4, 6, 8, 9, 11, 14, 16, 18, 21, 23, 25, 27
	2	151-0060	15	CAP CER. .1uf 16V AX	C1,3,5,7,10,12,13,15, 17,19,20,22,24,26,28
	3	170-0211	1	PC BOARD	
	4	213-0001	24	SKT 24 PIN DUAL INLN	XU1-XU24
1	5	314-0055	1	IC 74LS244	U25
	6	314-0058	3	IC 74LS08	U26-U28
	7	314-0059	1	IC 74LS10	U29
	8	314-0104	1	IC 74LS138	U30
	9	314-0120	1	IC 74LS154	U24
	10	211-0008	3	CONN PIN TEST PT	TP1-TP3
	11	150-0088	1	CAP E 10uf 25V	C29
	12	280-0330	2	CARD EJECTOR	

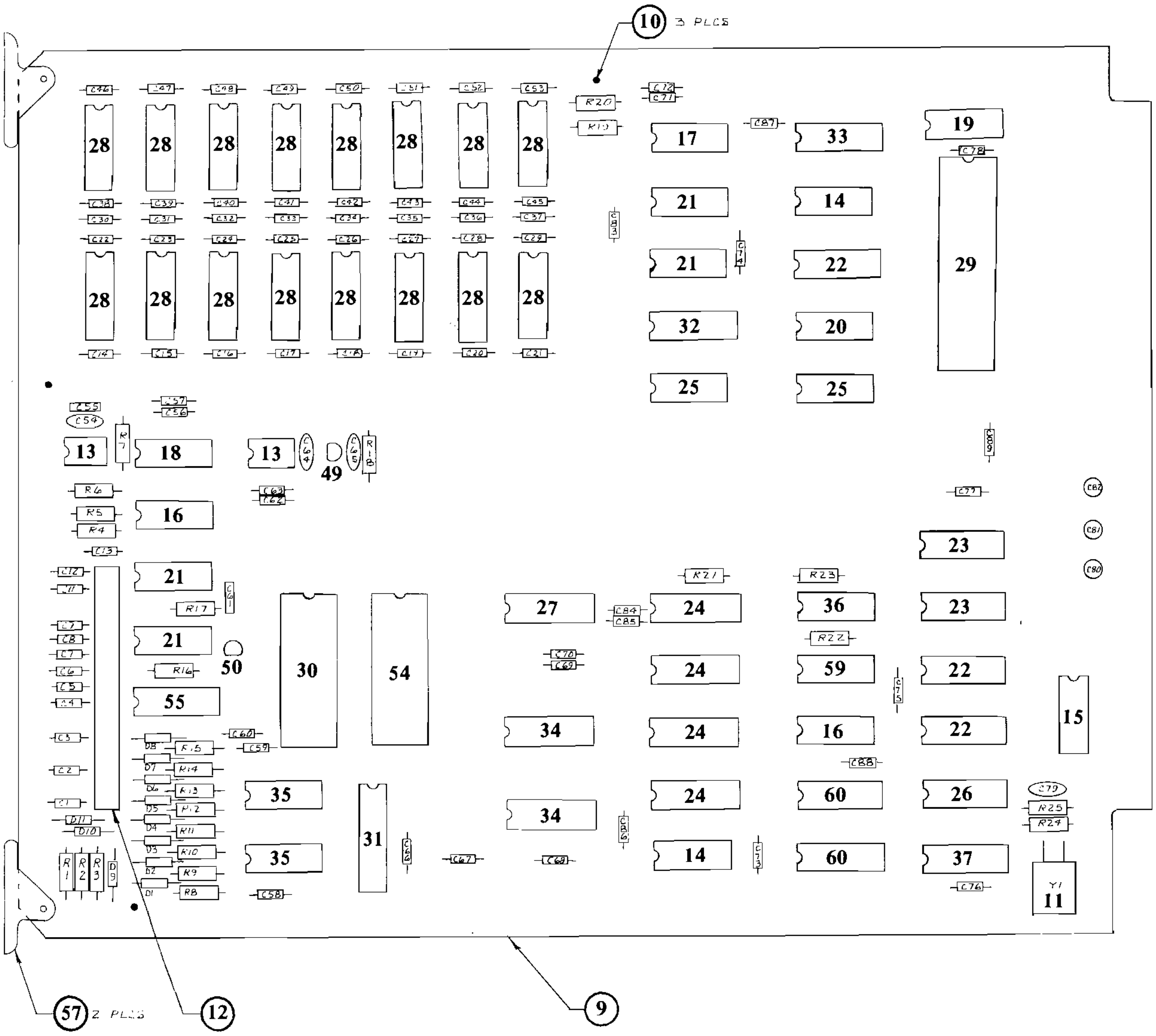


EPROM Board Assembly
800-0151

video I board assembly

PARTS LIST **DWG NO. 800-3160**

	Item #	Gremlin Part #	Qty Per Assembly	Description	Ref Des
	1	150-0088	3	CAP E 10uf 25V	C80-C82
	2	151-0005	1	CAP CER 680pf 50V	C79
	3	151-0008	1	CAP CER .001uf 50V	C65
	4	151-0011	2	CAP CER .01uf 50V	C54, C64
	5	151-0058	7	CAP CER .01uf 16V AX	C57, 60, 63, 70, 71, 84, 86
	6	151-0060	61	CAP CER .1uf 16V AX	C13-53, 56, 58, 59, 62, 66-69, 72-78, 83, 85, 87, 88, 89.
	7	151-0061	11	CAP CER 220pf 16V AX	C1-C9, C11, C12
	8	152-0007	2	CAP FILM .001 250V	C55, C61
	9	170-0193	1	PC BOARD	
	10	211-0008	3	CONN PIN TEST PT	TP1-TP3
1	11	230-0009	1	XTAL 15.46848	Y1
	12	212-0099	1	CONN 15 PIN M RTA	
2	13	314-0001	2	IC NE555	U1, U10
	14	314-0040	2	IC 74LS 125	U32, U50
	15	314-0046	1	IC 72S04	U60
	16	314-0058	2	IC 74LS08	U5, U44
	17	314-0059	1	IC 74LS10	U41
	18	314-0062	1	IC 74LS74	U6
	19	314-0067	1	IC 74LS30	U59
	20	314-0068	1	IC 74LS32	U48
	21	314-0070	4	IC 74LS86	U3, U4, U39, U40
	22	314-0073	3	IC 74LS175	U49, U54, U55
	23	314-0076	2	IC 74LS157	U56, U57
	24	314-0077	4	IC 74LS166	U33-U36
	25	314-0085	2	IC 74LS14	U37, U47
	26	314-0139	1	IC 74S163	U53
	27	314-0087	1	IC 74LS139	U15
	28	315-0039	16	IC 4015	U16-U31
1	29	315-0042	1	IC CUSTOM CHIP	U58
1	30	315-0065	1	IC 93419	U9
	31	314-0093	1	IC 74LS374	U11
1	32	314-0138	1	IC 74S283	U38
	33	314-0104	1	IC 74LS138	U51
	34	314-0123	2	IC 74LS257	U13, U14
	35	314-0124	2	IC 74LS33	U7, U8
	36	314-0125	1	IC 74LS38	U46
1	37	316-0806	1	IC 32X8 PROM	U52

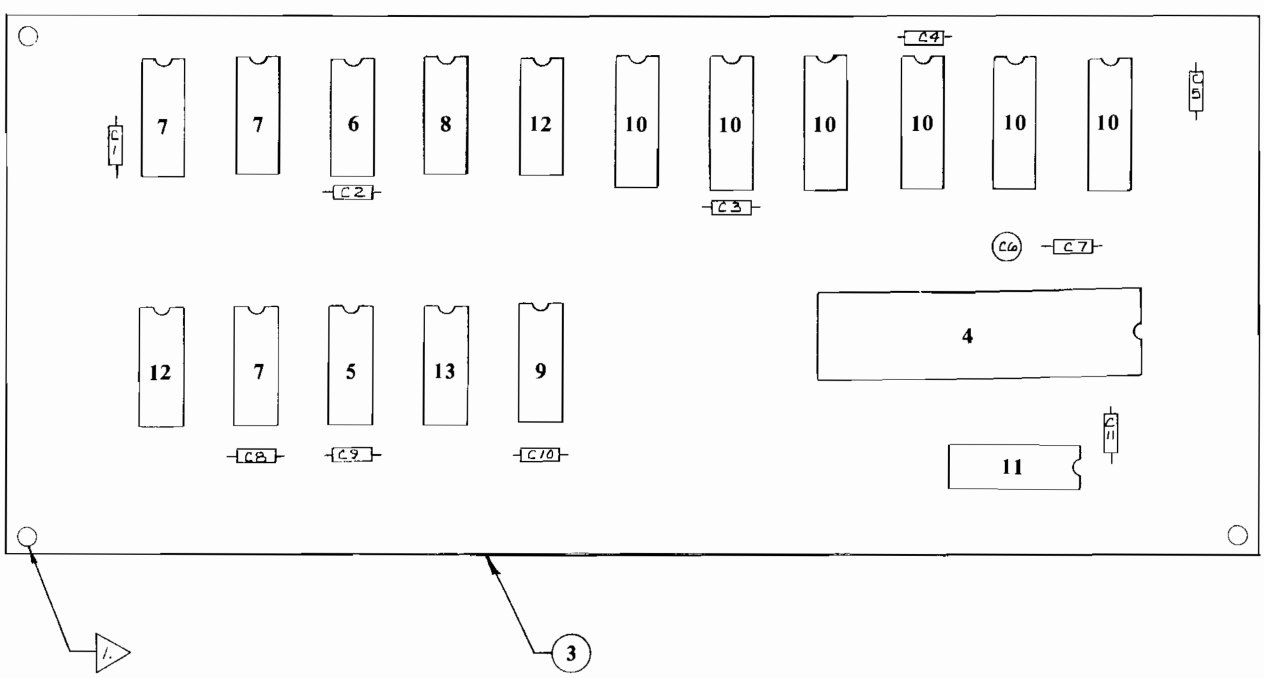


Video I Board Assembly
800-3160

PARTS LIST				DWG NO. 800-3160
Item #	Gremlin Part #	Qty Per Assembly	Description	Ref Des
38	471-0102	5	RES 1K OHM ½W 5%	R4-R6, R15, R16
39	471-0103	2	RES 10K OHM ½W 5%	R7, R17
40	471-0122	2	RES 1.2K OHM ½W 5%	R10, R13
41	471-0202	1	RES 2K OHM ½W 5%	R14
42	471-0222	3	RES 2.2K OHM ½W 5%	R21-R23
43	471-0242	2	RES 2.4K OHM ½W 5%	R9, R12
44	471-0330	2	RES 33 OHM ½W 5%	R19, R20
45	471-0331	8	RES 330 OHM ½W 5%	R24-R31
46	471-0472	2	RES. 4.7K OHM ½W 5%	R8, R11
47	471-0563	1	RES 56K OHM ½W 5%	R18
48	481-0006	11	DIODE 1N914/1N4148	D1-D11-9
49	482-0006	1	XSTR 2N4403	Q2
50	482-0014	1	XSTR 2N4401	Q1
51	213-0004	21	SKT 16 PIN DUAL INLN	XU16-XU31, XU38, XU42, XU43, XU52, XU53
52	213-0005	1	SKT 40 PIN DUAL INLN	XU58
53	213-0012	2	SKT 28 PIN DUAL INLN	XU9, XU12
54	315-0067	1	HEADER 28 PIN	U12
55	477-0002	1	RES PACK 15X2.2K	RP1
56	471-0221	3	RES 220 OHM ½W 5%	R1-R3
57	280-0330	2	CARD EJECTOR	
58	213-0003	1	SKT 14 PIN DUAL INLN	XU45
59	314-0140	1	IC 74S74	U45
60	314-0053	2	IC 74S175	U42, U43
61	151-0042	1	CAP CER 470 pf 50V	C90

VIC replacement board assembly

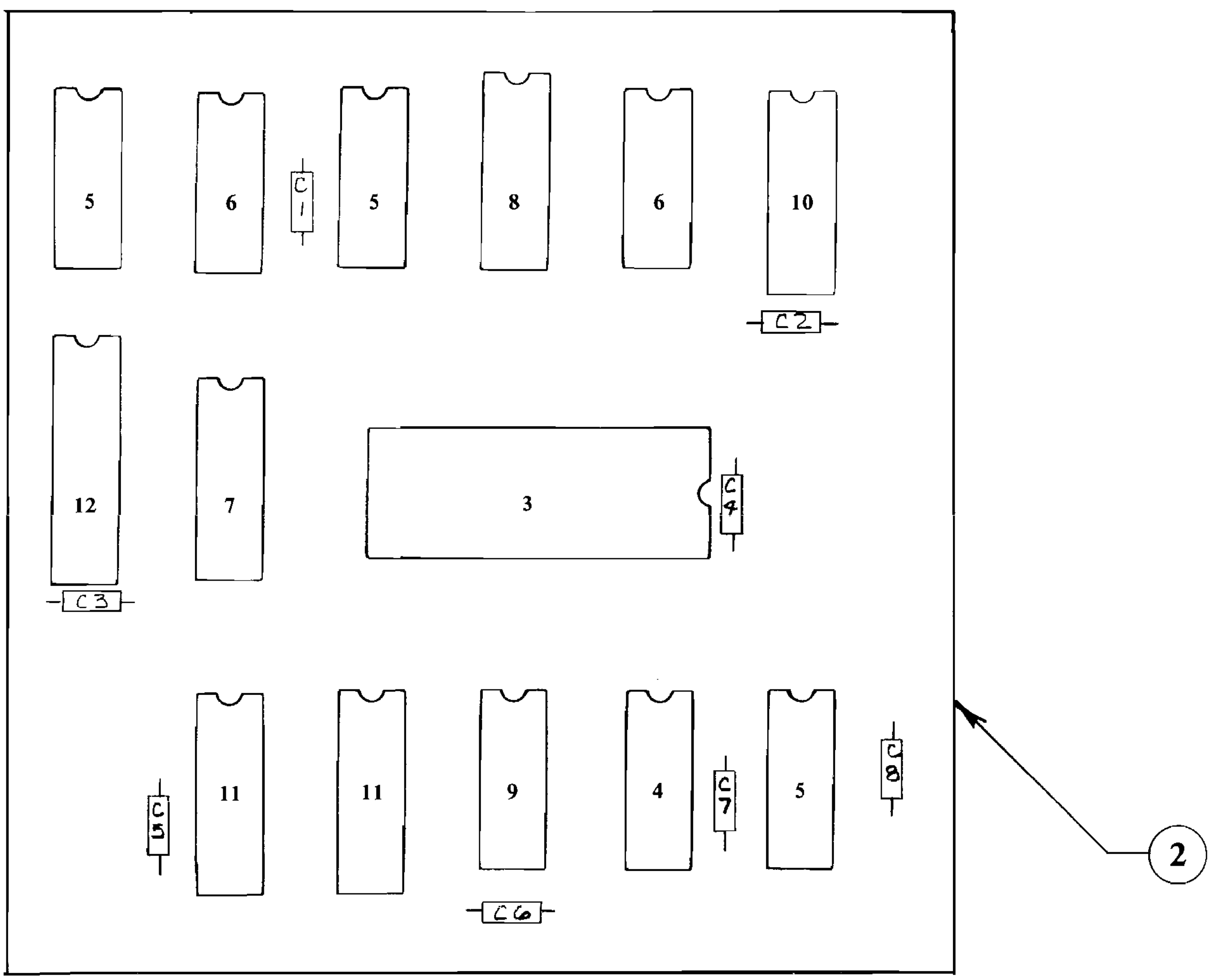
	PARTS LIST				DWG NO. 800-0212
	Item #	Gremlin Part #	Qty. Per Assembly	Description	Ref Des
	1	150-0088	1	CAP E 10uf 25V	C6
	2	151-0060	10	CAP CER .1uf 16V AX	C1-C5, C7-C11
	3	170-0227A	1	PC BOARD	
	4	213-0014	1	SKT 40 PIN WIRE WRAP	XU17
1	5	314-0058	1	IC 74LS08	U14
1	6	314-0059	1	IC 74LS10	U3
1	7	314-0062	3	IC 74LS74	U1, U2, U3
1	8	314-0067	1	IC74LS30	U4
5	9	314-0070	1	IC 74LS86	U16
6	10	314-0136	6	IC 74S151	U6-U11
5	11	314-0072	1	IC 74LS174	U18
5	12	314-0075	2	IC 74LS393	U5, U12
1	13	314-0085	1	IC 74LS14	U15
	14	280-0354	3	PCB SUPPORT LOCKING	



hardware shifter assembly

PARTS LIST — DWG NO. 800-0111

	Item #	Gremlin Part #	Qty Per Assembly	Description	Ref Des
	1	151-0060	8	CAP CER .1 16V AX	C1-C8
	2	170-0216	1	PC BOARD	
	3	213-0015	1	SKT 28 PIN WIREWRAP	XU9
1	4	314-0058	1	IC 74LS08	U13
3	5	314-0062	3	IC 74LS74	U1, U3, U14
2	6	314-0068	2	IC 74LS32	U2, U5
1	7	314-0071	1	IC 74LS151	U8
5	8	314-0075	1	IC 74LS175	U4
1	9	314-0085	1	IC 74LS14	U12
1	10	314-0097	1	IC 74LS161	U6
2	11	314-0121	2	IC 74LS395	U10, U11
5	12	314-0122	1	IC 74LS299	U7



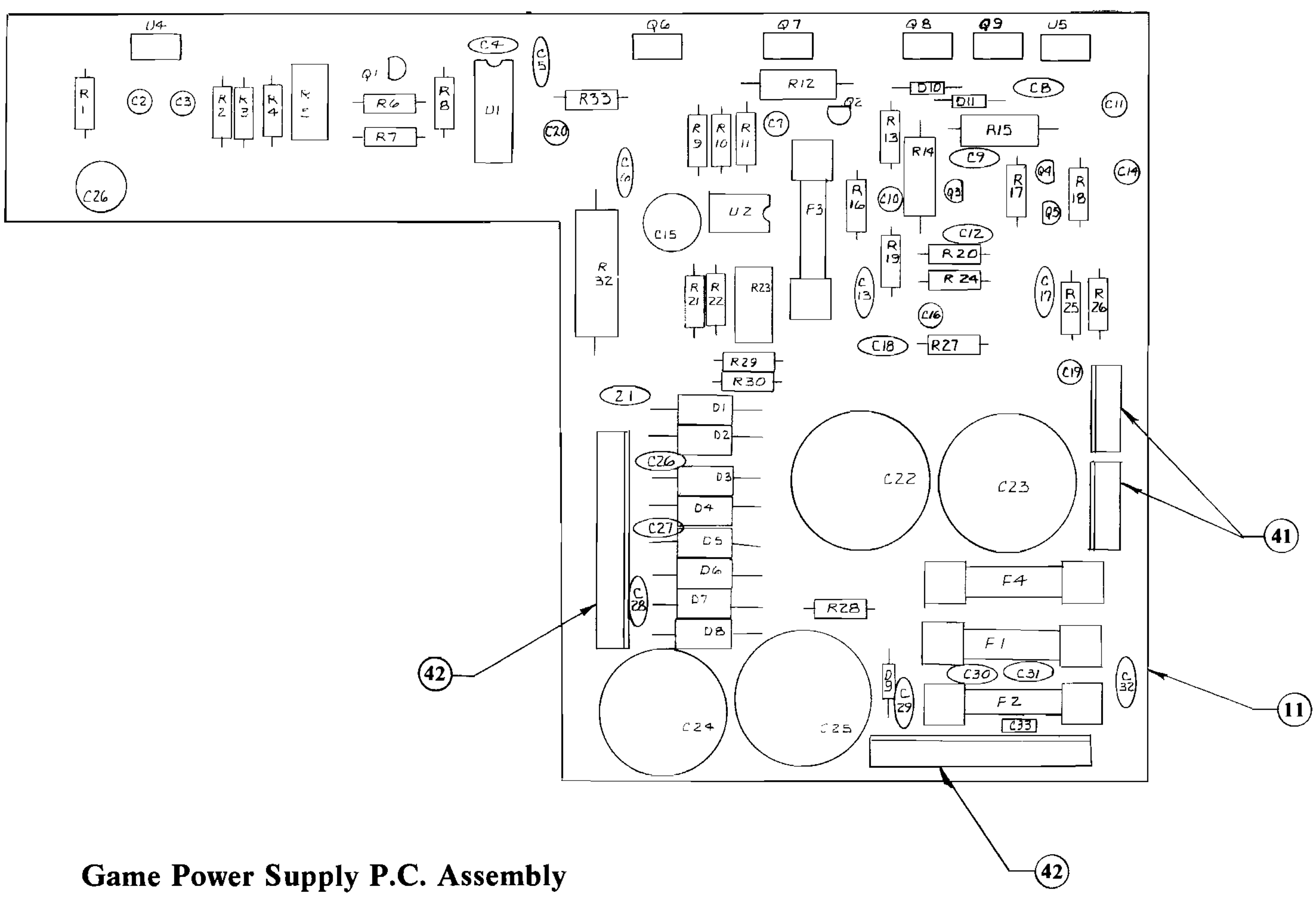
game power supply P.C. assembly

	Item #	Gremlin Part #	Qty Per Assembly	Description	Ref Des
	PARTS LIST				**DWG NO. 800-0128**
	1	150-0088	9	CAP E 10uf 25V RDL	C2, 3, 7, 10, 11, 14, 16, 19, 20
	2	150-0092	2	CAP E 100uf 25V RDL	C15, C26
	3	150-0095	1	CAP E 3300uf 16V RDL	C24
1	4	150-0096	1	CAP E 6800uf 16V RDL	C25
2	5	150-0097	2	CAP E 4700uf 25V RDL	C22, C23
	6	151-0002	1	CAP CER 100pf 50V	C9
	7	151-0007	1	CAP CER .005uf 100V	C5
	8	151-0008	1	CAP CER .001uf 50V	C17
	9	151-0011	2	CAP CER. .01uf 50V	C4, C33
	10	151-0012	12	CAP CER .1uf 50V	C6, 8, 13, 18, 21, 26-32
	11	170-0202	1	PC BOARD	
	12	151-0021	1	CAP CER 20pf 50V	C12
1	13	313-0001	1	IC LM 723 DIP	U1
1	14	313-0037	1	IC TL081	U2
1	15	313-0015	1	IC LM 320T-12	U5
1	16	313-0023	1	IC LM 320T-5	U4
	17	471-0011	1	RES 10 OHM ½W5%	R19
	18	471-0101	1	RES 100 OHM ½W 5%	R2
	19	471-0102	6	RES 1K OHM ½W 5%	R6, 7, 11, 21, 22, 24
	20	471-0103	2	RES 10K OHM ½W 5%	R8, R27
	21	471-0122	1	RES 1.2K OHM ½W 5%	R3
	22	471-0221	1	RES 220 OHM ½W 5%	R33
	23	471-0222	3	RES 2.2K OHM ½W 5%	R13, R16, R26
	24	471-0272	1	RES 2.7K OHM ½W 5%	R30
	25	471-0332	1	RES 3.3K OHM ½W 5%	R4
	26	471-0471	1	RES 470 OHM ½W 5%	R9
	27	471-0472	2	RES 4.7K OHM ½W 5%	R1, R29
	28	471-0473	1	RES 47K OHM ½W 5%	R10
1	29	473-00R1	1	RES .1 OHM 5W 3%	R32
3	30	473-00R2	3	RES .2 OHM 3W 5%	R12, R14, R15
	31	475-0004	2	POT 1K CAR PCMTV	R5, R23

Game Power Supply P.C. Assembly—Continued

PARTS LIST — **DWG NO. 800-0128**

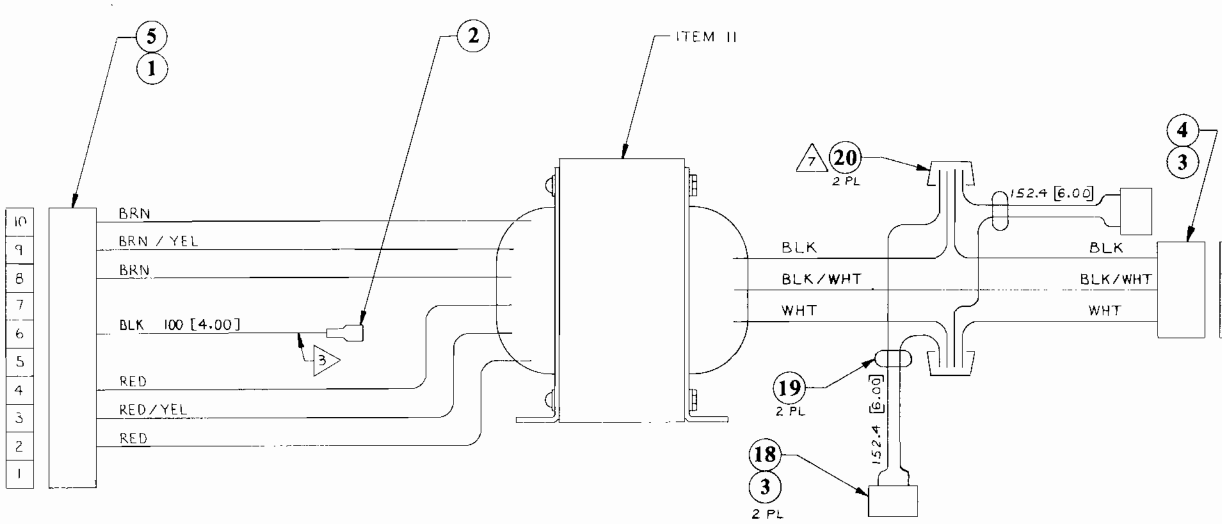
	Item #	Gremlin Part #	Qty Per Assembly	Description	Ref Des
	32	481-0004	8	DIODE MR501	D1-D8
3	33	481-0006	3	DIODE 1N914/1N4148	D9-D11
3	34	482-0006	3	XSTR 2N4403	Q1-Q3
2	35	482-0014	2	XSTR 2N4401	Q4, Q5
2	36	482-0019	2	XSTR TIP120	Q6, Q8
2	37	482-0100	2	XSTR TIP125	Q7, Q9
2	38	514-0002	2	FUSE 3A NORM	F3, F4
	39	514-0003	8	CLIP FUSE MTG.	
	40	514-0006	1	FUSE 1.5 A NORM	F2
1	41	212-0004	2	CONN 4 PIN M	
	42	212-0021	2	CONN 10 PIN M	
1	43	514-0055	1	FUSE 5A NORM	F1
	44	471-0220	1	RES 22 OHM ½W 5%	R17
	45	471-0223	2	RES 22K OHM ½W 5%	R20, R25
	46	471-0681	1	RES 680 OHM ½W 5%	R18
	47	471-0104	1	RES 100K OHM ½W 5%	R28

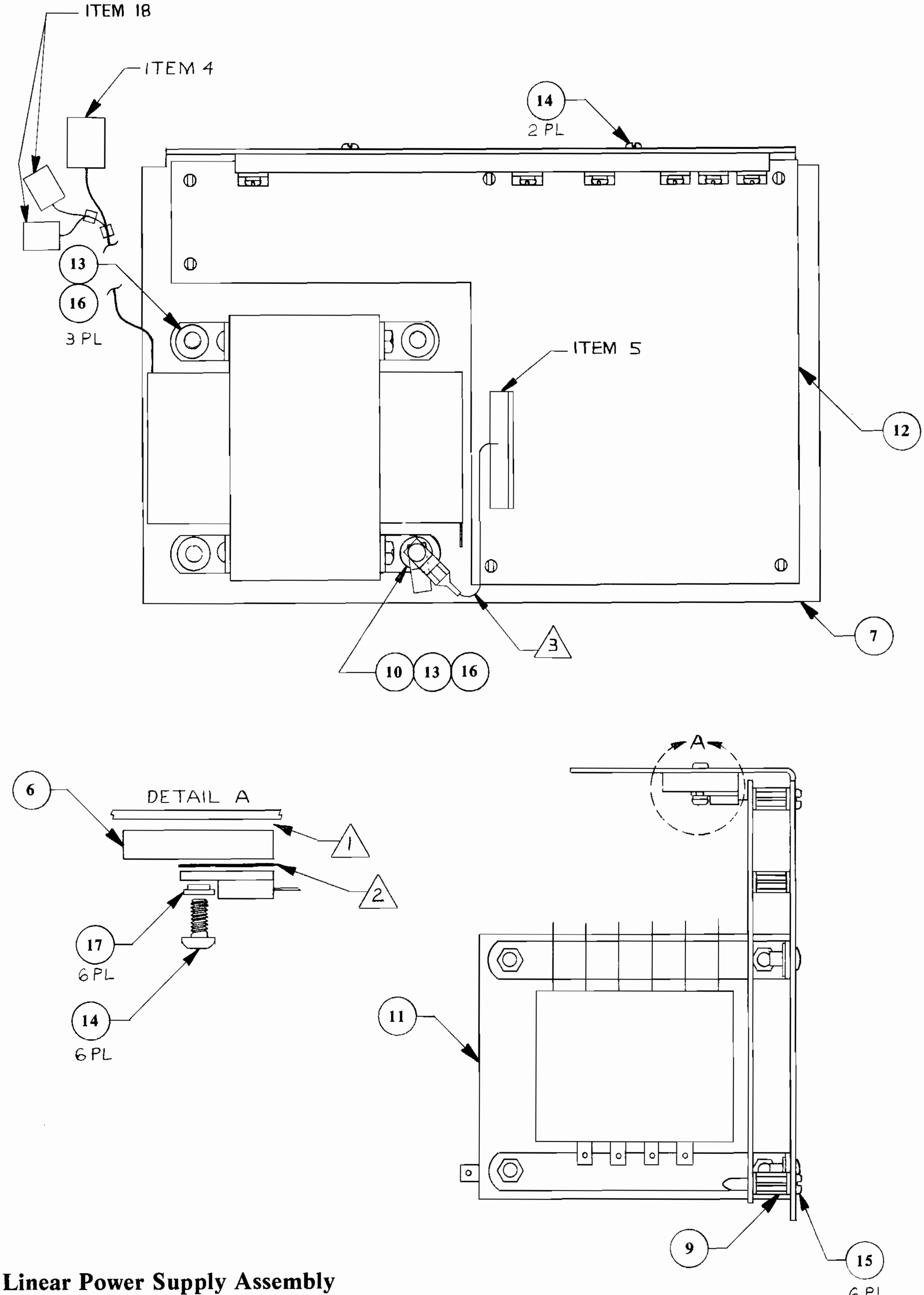


Game Power Supply P.C. Assembly
800-0128

linear power supply assembly

	PARTS LIST			DWG NO. 800-0146
	Item #	Gremlin Part #	Qty Per Assembly	Description
	1	211-0005	6	CONN CRIMP LOCK
	2	211-0017	1	CONN QUICK ¼"
	3	211-0042	7	CONN SOCKET AMP
	4	211-0059	1	CONN PLUG 3 PIN AMP
	5	212-0016	1	CONN FEM 10 PIN
	6	250-0433	1	HEAT SINK PWR SPLY ISOL
	7	250-0434	1	CHASSIS PWR SPLY ISOL
	8	280-0005	4	CABLE TIE
	9	280-0014	6	STAND OFF CLIPS
	10	280-0117	1	TAB RIVET
1	11	560-0054	1	XFMR ISOL
	12	800-0128	1	P.C. ASSY GM PWR SPLY
	13		4	RIVET POP 3/16
	14		8	SCR MACH PN HD #4-40x¼
	15		6	SCR SHT METAL #6x½
	16		4	WASHER FLAT #10
	17		6	TRANSISTOR INSULATOR
	18	211-0043	2	CONN PLUG 2 PIN AMP
	19	600-0079	1 FT.	2 COND ZIP CORD
	20	280-0359	2	ELECTRIC CRIMP SLEEVE



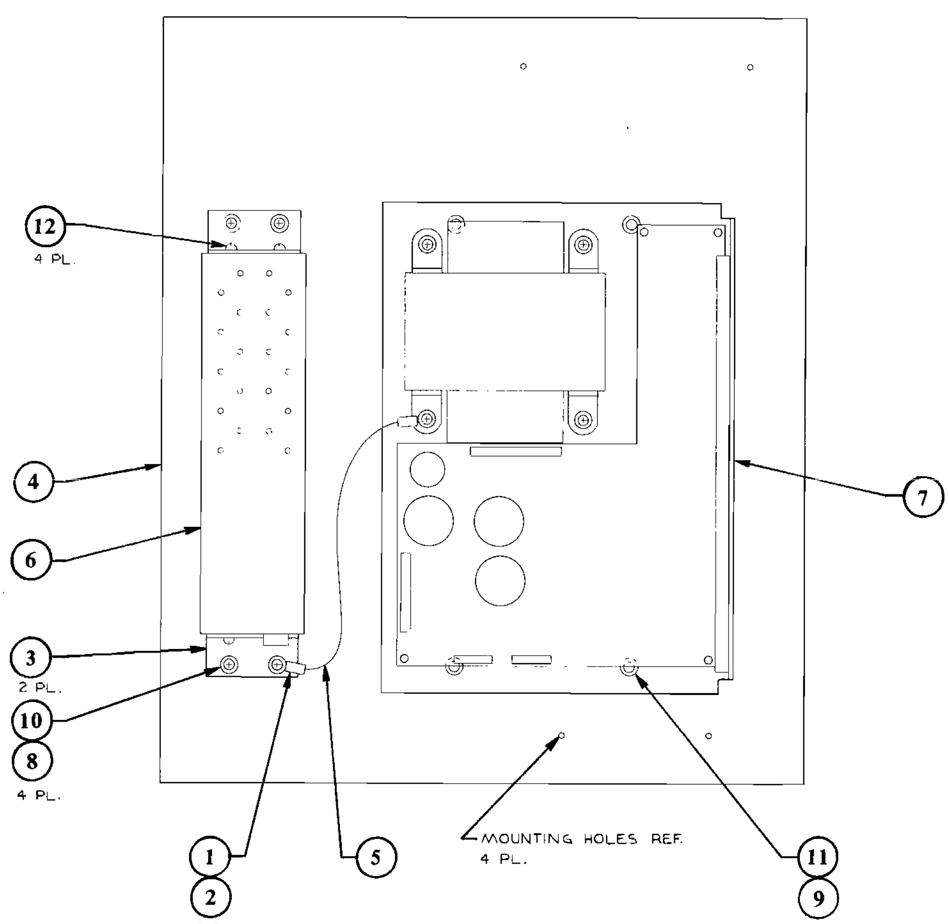


Linear Power Supply Assembly
800-0146

power supply assembly

PARTS LIST **DWG NO. 800-0270**

Item #	Gremlin Part #	Qty Per Assembly	Description
1	211-0017	2	QUICK CONNECTOR ¼"
2	211-0076	2	SPADE LUG 4"
3	250-0490	2	BRACKET SUPPORT SWITCHER
4	252-0124	1	MOUNTING BOARD SWITCHER
5	600-0038	1	WIRE BRAIDED 8.00 L.
6	601-0158	1	SWITCHING POWER SUPPLY
7	800-0146	1	LINEAR POWER SUPPLY
8		4	WASHER FLAT #6
9		4	WASHER FLAT #10
10		4	SCR. PHIL. PAN HD. #6x.50 L. SHT. MTL.
11		4	SCR. PHIL. PAN HD. #10x.75 L. SHT. MTL.
12		4	SCR. PHIL. PAN HD. M 3x6 METRIC



background generator assembly

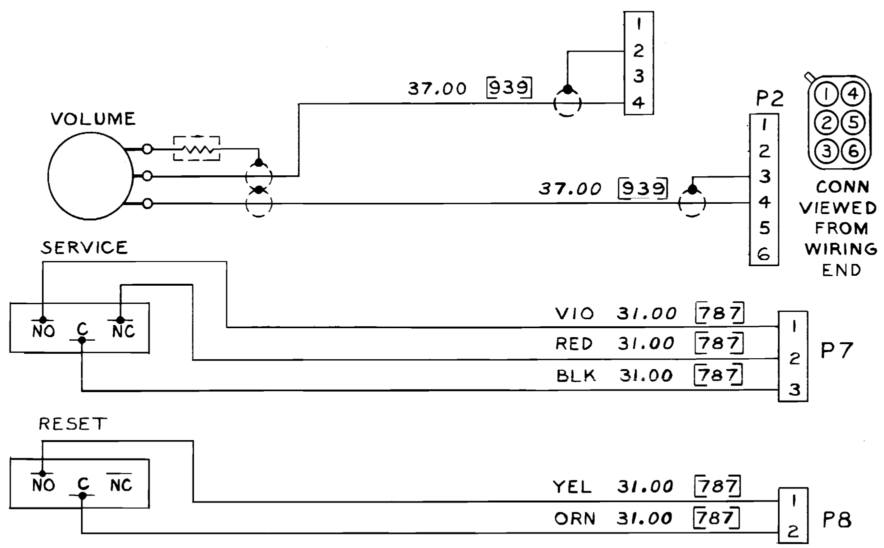
PARTS LIST — **DWG NO. 834-0027**

	Gremlin Part #	Description	Ref. Des.
1	312-0263	EPROM 18	U10
1	312-0262	EPROM 17	U9
1	312-0261	EPROM 16	U8
1	312-0260	EPROM 15	U7
1	312-0259	EPROM 14	U6
1	312-0258	EPROM 13	U5
1	312-0257	EPROM 12	U4
1	312-0256	EPROM 11	U3
1	312-0255	EPROM 10	U2
1	312-0254	EPROM 9	U1
2	314-0075	SN74LS393	U60-61
2	314-0119	SN74LS377	U34, U37-U39
	314-0101	SN74LS283	U12, U24, U51-U54
5	314-0055	SN74LS244	U41-U42
	314-0074	SN74LS191	U33, U36, U43-U46
	314-0072	SN74LS174	U40
	314-0077	SN74LS166	U16-U21, U27-U32
	314-0076	SN74LS157	U35
5	314-0104	SN74LS138	U22, U65-U66
	314-0040	SN74LS125	U57, U68
	312-0019	SN74107	U59
	314-0070	SN74LS86	U13-U15, U23
	314-0145	SN74LS85	U11
	314-0062	SN74LS74	U63
	314-0067	SN74LS30	U62
5	314-0066	SN74LS27	U50
	312-0021	SN7425	U67
5	314-0010	SN7410	U55
	312-0153	SN7416	U47, U56
	314-0059	SN74LS10	U48-U49
	314-0019	SN74LS04	U25, U58
	314-0078	SN74LS02	U64
	314-0018	SN74LS00	U26

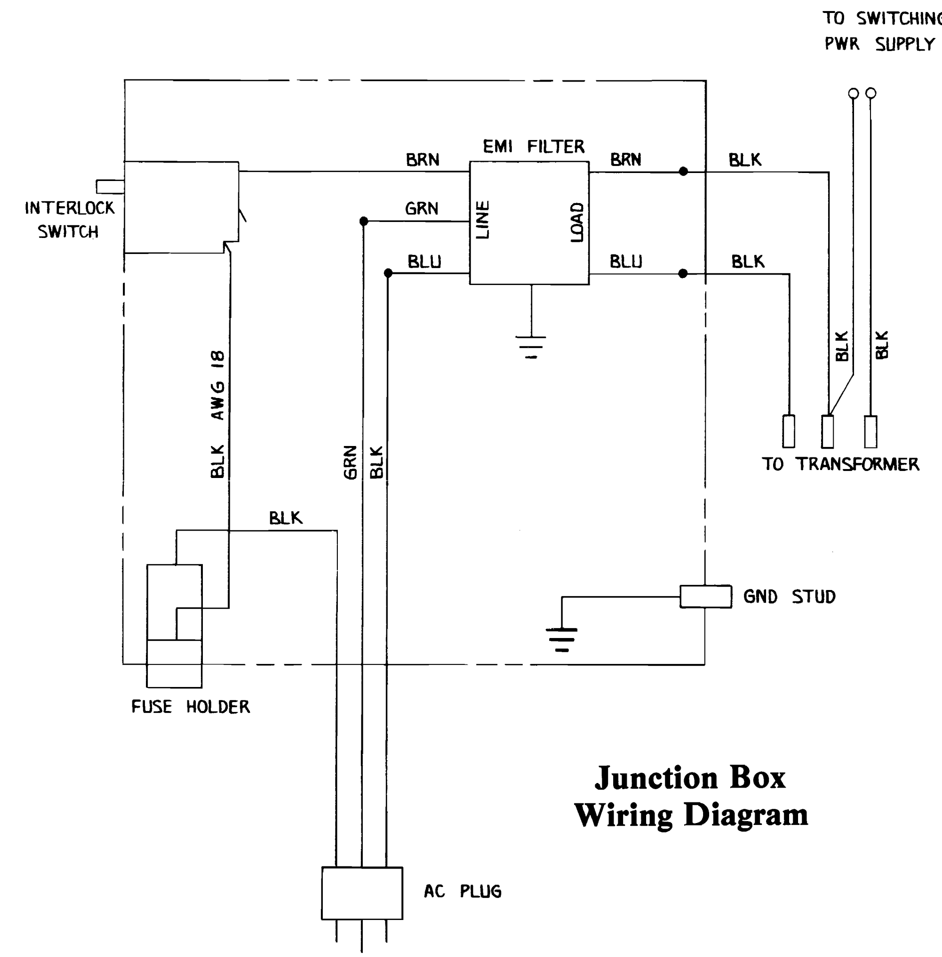
sound board assembly

	PARTS LIST		DWG NO. 834-0041
	Gremlin Part #	**Description**	**Ref. Des.**
1	313-0042	AN6551	IC1,5
1	313-0041	MN3005	IC2
1	313-0040	MN3101	IC3
4	313-0034	LM324	IC8, 7, 13, 15, 16, 17, 18, 21, 23, 24, 25, 26, 27, 29.
	312-0209	MB4391	IC9, 10, 11, 12
1	314-0119	74LS377	IC43,44

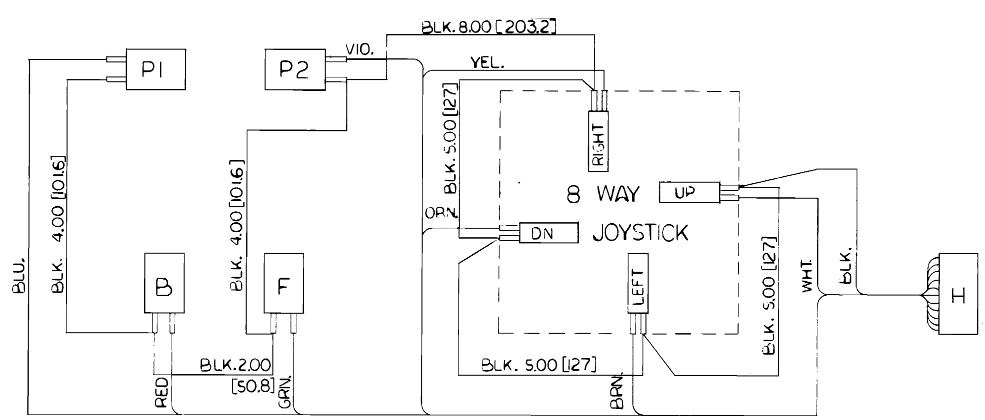
schematics



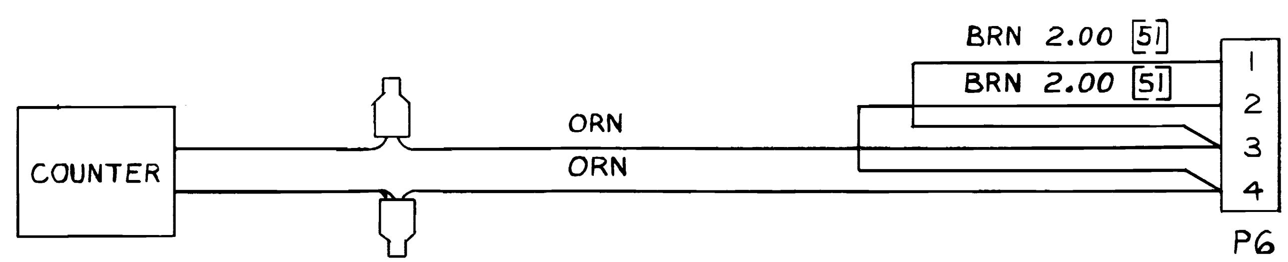
Volume Control Block Wiring Diagram



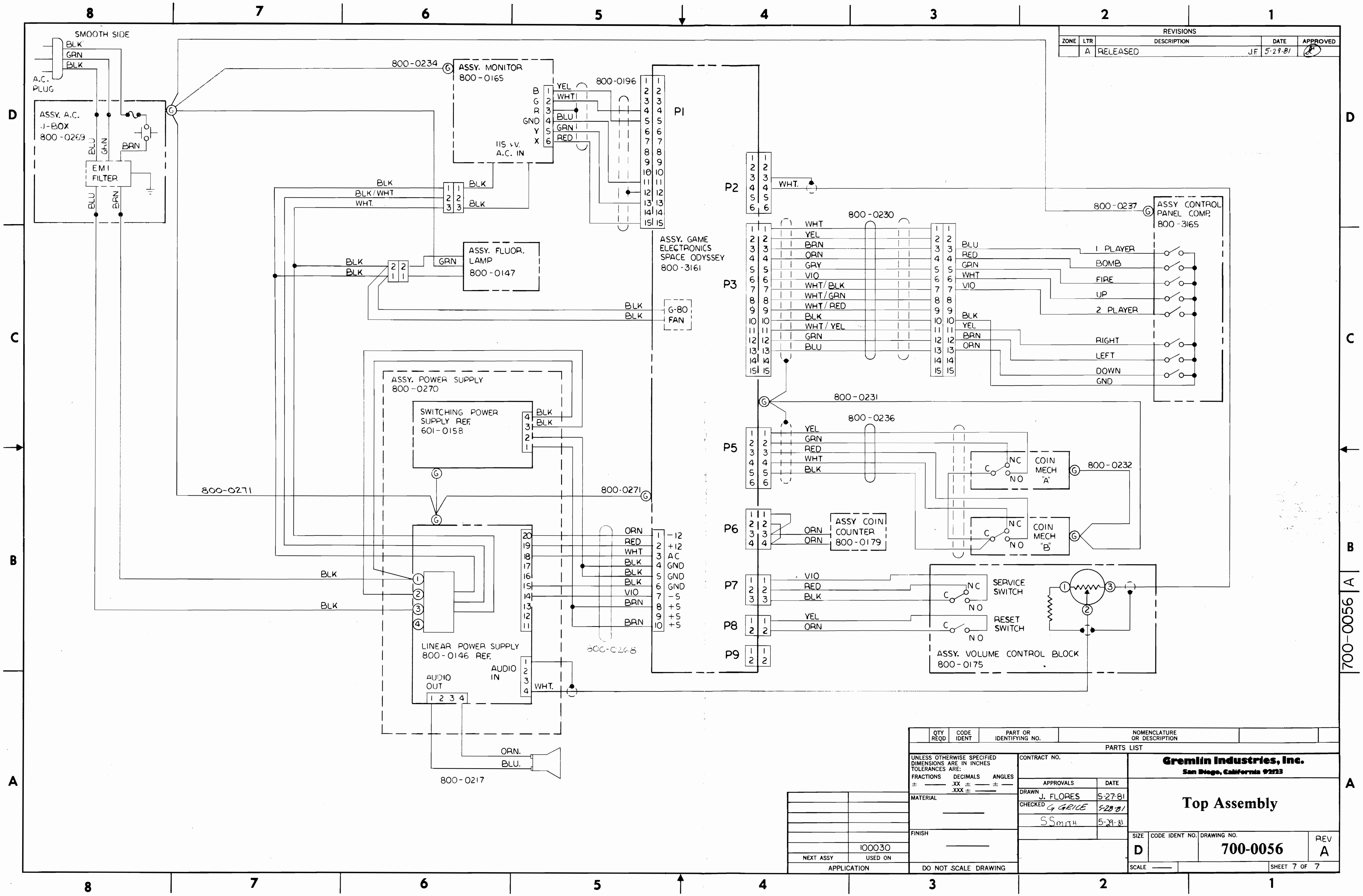
Junction Box Wiring Diagram

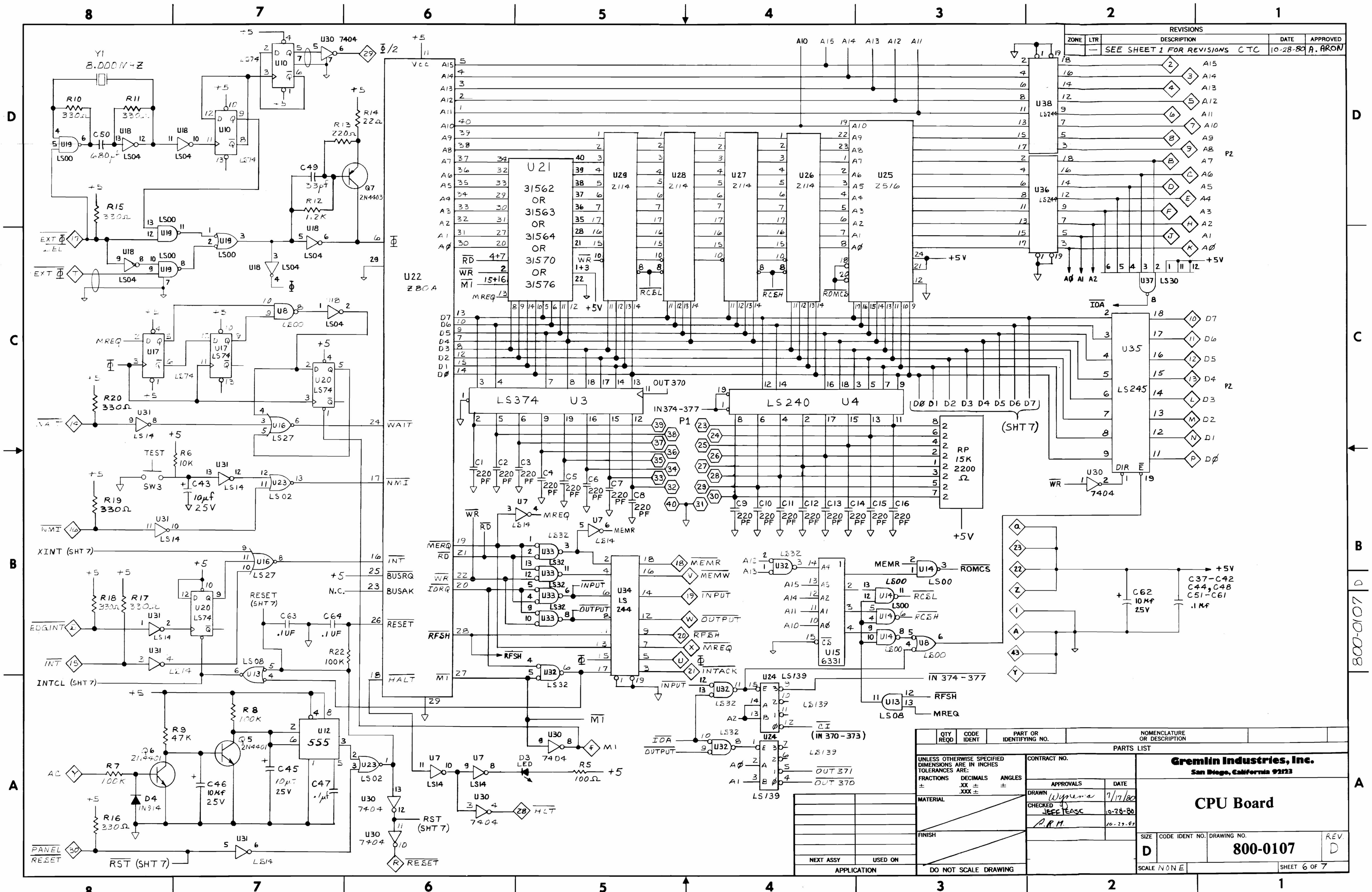


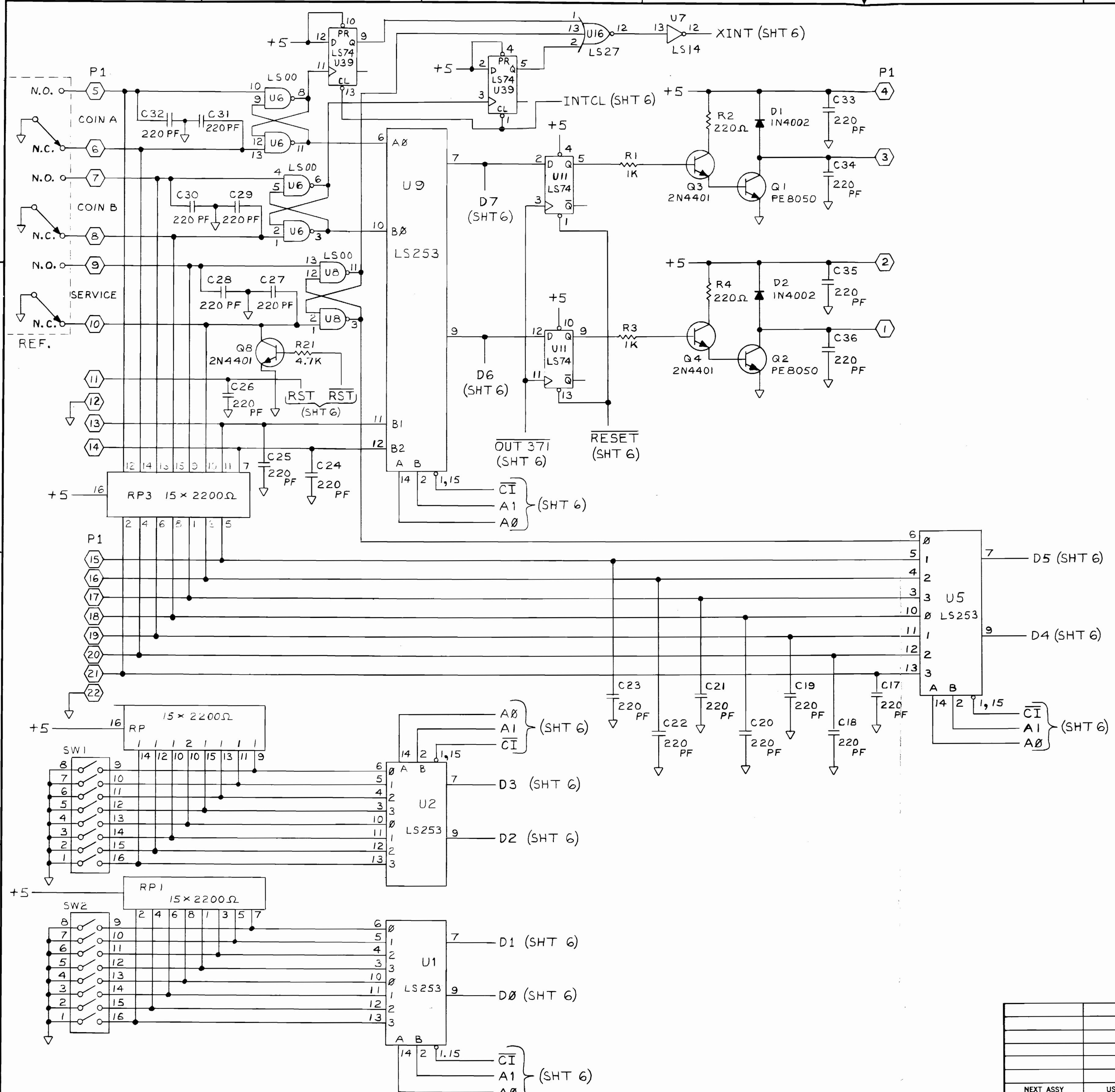
Control Panel Wiring Diagram



Coin Counter Wiring Diagram


REVISIONS
ZONE | LTR | DESCRIPTION | DATE | APPROVED
A | RELEASED | J.F. | 5-29-81
SMOOTH SIDE
BLK
GRN
BLK
A.C. PLUG
ASSY. A.C. J-BOX 800-0269
EMI FILTER
BRN
BLU
800-0234
ASSY. MONITOR 800-0165
115 V. A.C. IN
800-0196
P1
P2
P3
P5
P6
P7
P8
P9
ASSY. GAME ELECTRONICS SPACE ODYSSEY 800-3161
ASSY. FLUOR. LAMP 800-0147
G-80 FAN
800-0230
800-0237
ASSY CONTROL PANEL COMP. 800-3165
1 PLAYER
BOMB
FIRE
UP
2 PLAYER
RIGHT
LEFT
DOWN
GND
800-0231
800-0236
COIN MECH "A"
COIN MECH "B"
800-0232
ASSY COIN COUNTER 800-0179
SERVICE SWITCH
RESET SWITCH
ASSY. VOLUME CONTROL BLOCK 800-0175
ASSY. POWER SUPPLY 800-0270
SWITCHING POWER SUPPLY REF. 601-0158
800-0271
LINEAR POWER SUPPLY 800-0146 REF.
AUDIO OUT
AUDIO IN
800-0268
800-0217
ORN.
BLU.
-12
+12
AC
GND
GND
GND
-5
+5
+5
+5
QTY REQD | CODE IDENT | PART OR IDENTIFYING NO. | NOMENCLATURE OR DESCRIPTION
PARTS LIST
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS DECIMALS ANGLES
MATERIAL
FINISH
100030
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING
CONTRACT NO.
APPROVALS DATE
DRAWN J. FLORES 5-27-81
CHECKED G. GRICE 5-28-81
S Smith 5-29-81
Gremlin Industries, Inc.
San Diego, California 92123
Top Assembly
SIZE D
CODE IDENT NO.
DRAWING NO. 700-0056
REV A
SCALE
SHEET 7 OF 7
700-0056 A


REVISIONS
ZONE | LTR | DESCRIPTION | DATE | APPROVED
— | SEE SHEET 1 FOR REVISIONS CTC | 10-28-80 | A. ARON
Y1 8.000MHZ
U21 31562 OR 31563 OR 31564 OR 31570 OR 31576
U22 Z80A
U29 2114
U28 2114
U27 2114
U26 2114
U25 2516
U38 LS244
U36 LS244
U35 LS245
LS374 U3
LS240 U4
U34 LS 244
U15 6331
U12 555
RP 15K 2200 Ω
WAIT
NMI
INT
BUSRQ
BUSAK
RESET
HALT
MEMR
MEMW
INPUT
OUTPUT
RFSH
MREQ
INTACK
ROMCS
RCSL
RCSH
IN 374-377
IN 370-373
OUT 371
OUT 370
PARTS LIST
QTY REQD | CODE IDENT | PART OR IDENTIFYING NO. | NOMENCLATURE OR DESCRIPTION
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±
MATERIAL
FINISH
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING
CONTRACT NO.
APPROVALS
DATE
DRAWN 7/17/80
CHECKED JEFF TEASC 10-28-80
A.R.M. 10-29-80
Gremlin Industries, Inc.
San Diego, California 92123
CPU Board
SIZE D
CODE IDENT NO.
DRAWING NO. 800-0107
REV. D
SCALE NONE
SHEET 6 OF 7
800-0107 D



ZONE	LTR	DESCRIPTION		DATE	APPROVED
	A	RELEASED	CTC	10-28-80	A. ARON
	B	ECN # 528	CTC	11-13-80	JEFF ROSE
	C	ECN # 669	CTC	2-6-81	
	D	ECN # 677A	CTC	2-25-81	

REVISIONS

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

NEXT ASSY | USED ON

APPLICATION

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN C.T. CATTELL	10-23-80
CHECKED JEFF ROSE	10-28-80
A.R.M.	10-29-80

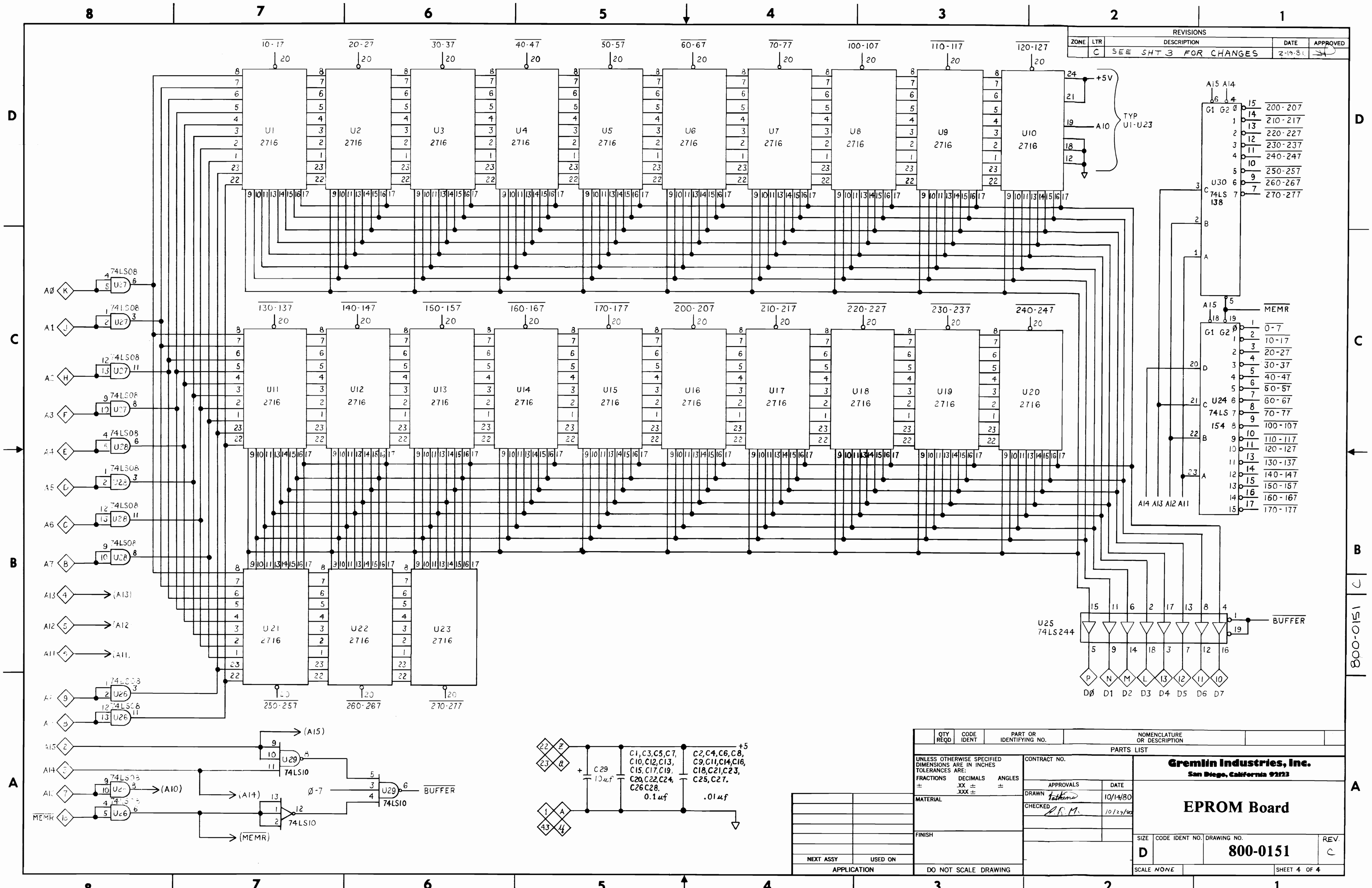
Gremlin Industries, Inc.
San Diego, California 92123

CPU Board

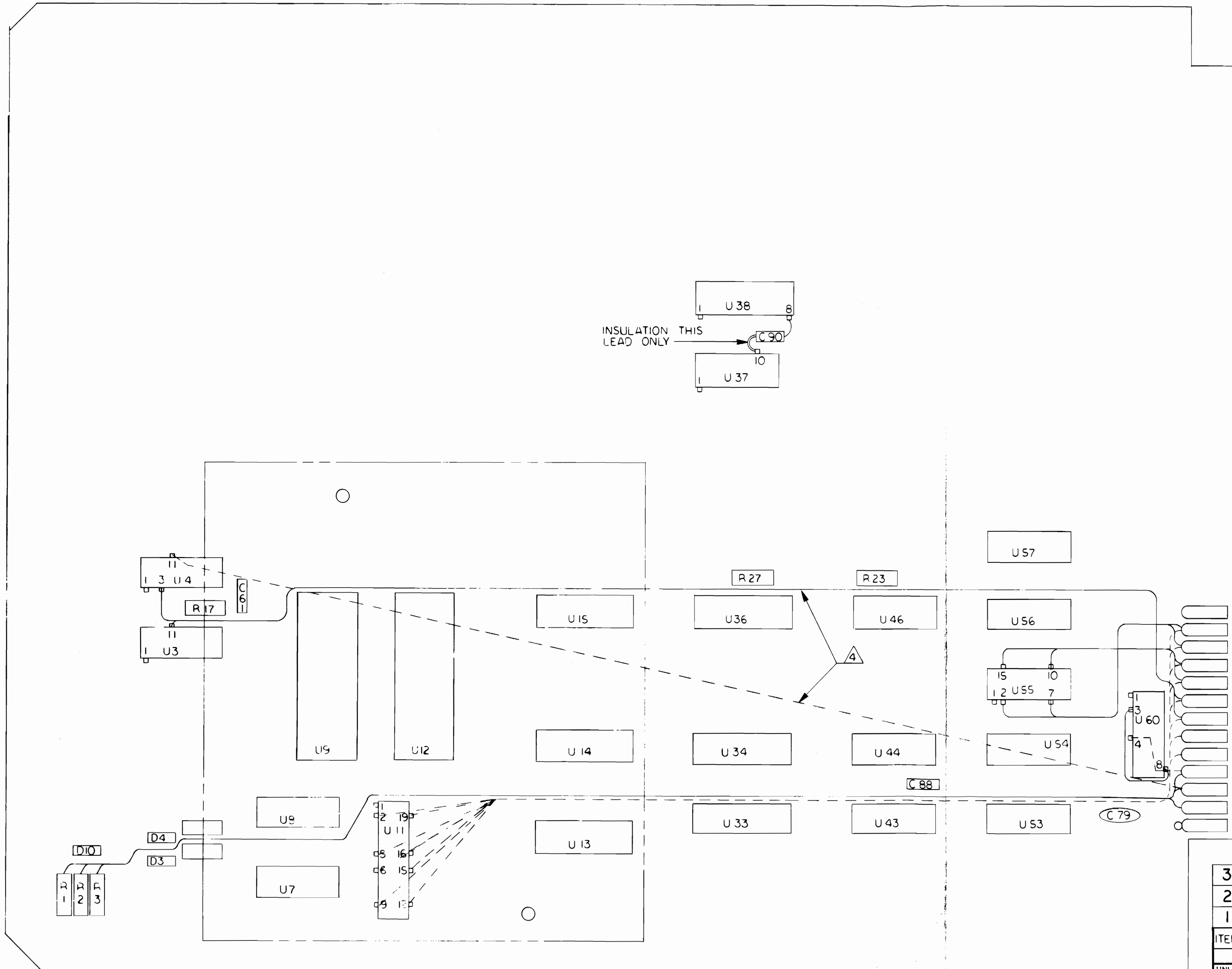
SIZE D | CODE IDENT NO. | DRAWING NO. 800-0107 | REV D

SCALE NONE | SHEET 7 OF 7

800-0107 D


REVISIONS
ZONE LTR DESCRIPTION DATE APPROVED
C SEE SHT 3 FOR CHANGES 2-19-81
U1 2716
U2 2716
U3 2716
U4 2716
U5 2716
U6 2716
U7 2716
U8 2716
U9 2716
U10 2716
U11 2716
U12 2716
U13 2716
U14 2716
U15 2716
U16 2716
U17 2716
U18 2716
U19 2716
U20 2716
U21 2716
U22 2716
U23 2716
+5V
A10
TYP U1-U23
U30 74LS 138
U24 74LS 154
MEMR
U25 74LS244
BUFFER
D0 D1 D2 D3 D4 D5 D6 D7
74LS08
74LS10
(A15)
(A14)
(A10)
(MEMR)
Ø-7
C29 10uf
C1, C3, C5, C7, C10, C12, C13, C15, C17, C19, C20, C22, C24, C26 C28. 0.1uf
C2, C4, C6, C8, C9, C11, C14, C16, C18, C21, C23, C25, C27. .01uf
QTY REQD CODE IDENT PART OR IDENTIFYING NO. NOMENCLATURE OR DESCRIPTION
PARTS LIST
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS DECIMALS ANGLES
MATERIAL
FINISH
NEXT ASSY USED ON
APPLICATION
DO NOT SCALE DRAWING
CONTRACT NO.
APPROVALS DATE
DRAWN 10/14/80
CHECKED 10/27/80
Gremlin Industries, Inc.
San Diego, California 92123
EPROM Board
SIZE D
CODE IDENT NO.
DRAWING NO. 800-0151
REV. C
SCALE NONE
SHEET 4 OF 4
800-0151 C

ZONE	LTR	DESCRIPTION	DATE	APPROVED
REVISIONS				
	A	RELEASED J.F.	5-21-81	GC



⚠1

FROM DEVICE DESIGNATION	TO EDGE CONNECTOR DESIGNATION
R1	v
R2	w
R3	x
U 3 PIN 11	r
U 4 PIN 3	s
U 4 PIN 11	41
U 11 PIN 2	39
U 11 PIN 5	37
U 11 PIN 6	35
U 11 PIN 9	33
U 11 PIN 12	32
U 11 PIN 15	34
U 11 PIN 16	36
U 11 PIN 19	38
U 55 PIN 2	m
U 55 PIN 7	l
U 55 PIN 10	p
U 55 PIN 15	n
U 60 PIN 3	U60 PIN 8
U 60 PIN 4	40

DESIGNATION	
NEAR SIDE	FAR SIDE
k	31
l	32
m	33
n	34
p	35
r	36
s	37
t	38
u	39
v	40
w	41
x	42
y	43

ITEM	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	VENDER
3	1		800-0111	HARDWARE SHIFTER ASSY	
2	1		800-0106	VIDEO I BOARD	
1	2		280-0354	PCB SUPPORT 5 LOCKING	

PARTS LIST

4\. ATTACH JUMPER WIRES TO PC BOARD BOTH SIDES USING LOCTITE SUPER BONDER OR EQUAL.

3\. JUMPER WIRE TO BE 30 GA. INSULATED.

2\. SOLDER DEVICE C90 BETWEEN DEVICES U 37 AND U 38 AS SHOWN.

⚠1 ADD JUMPER WIRES AS PER CHART.

NOTES:

NEXT ASSY	USED ON
	100030
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

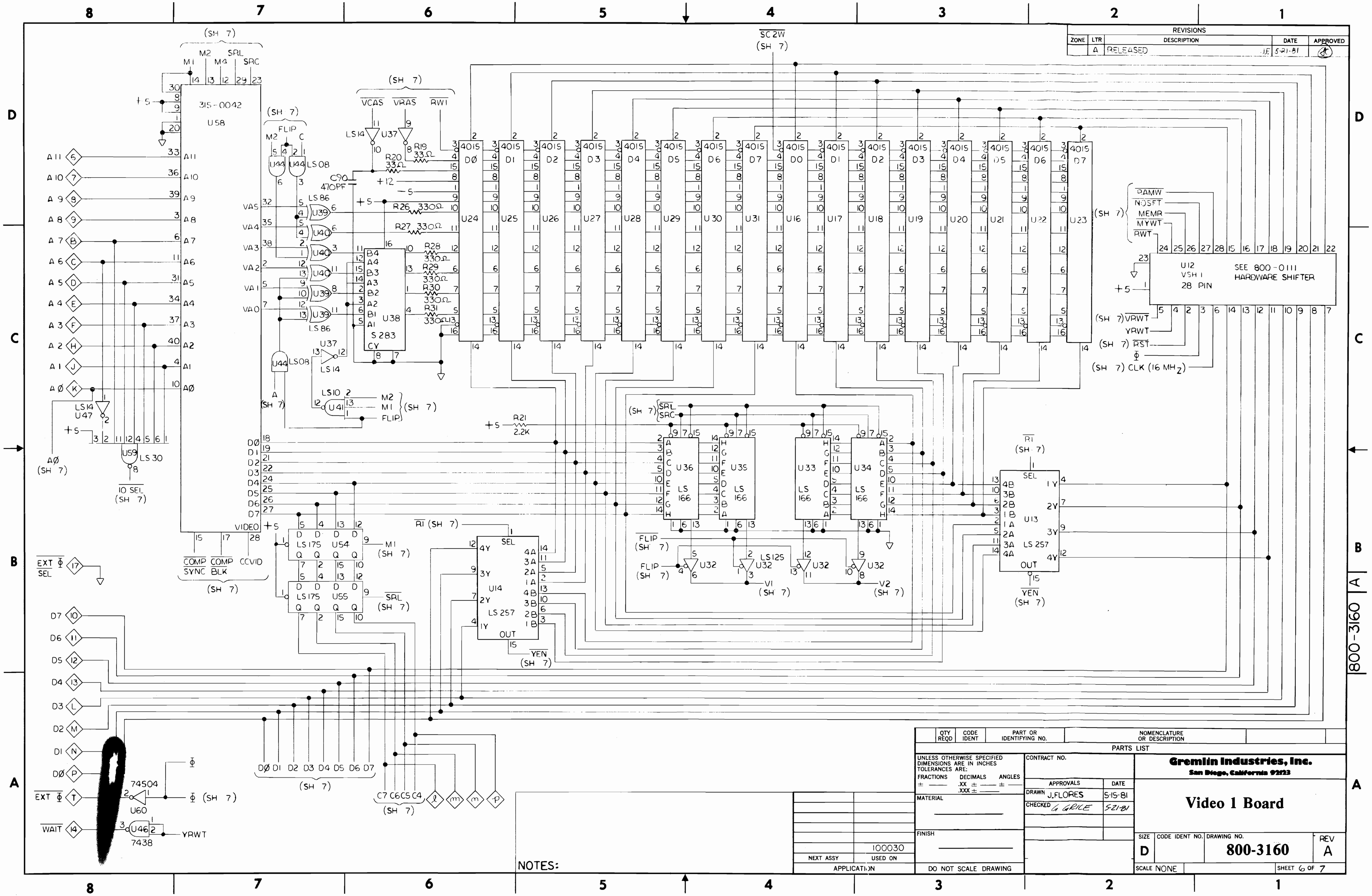
APPROVALS		DATE
DRAWN	J.FLORES	5-18-81
CHECKED	G GRICE	5-21-81

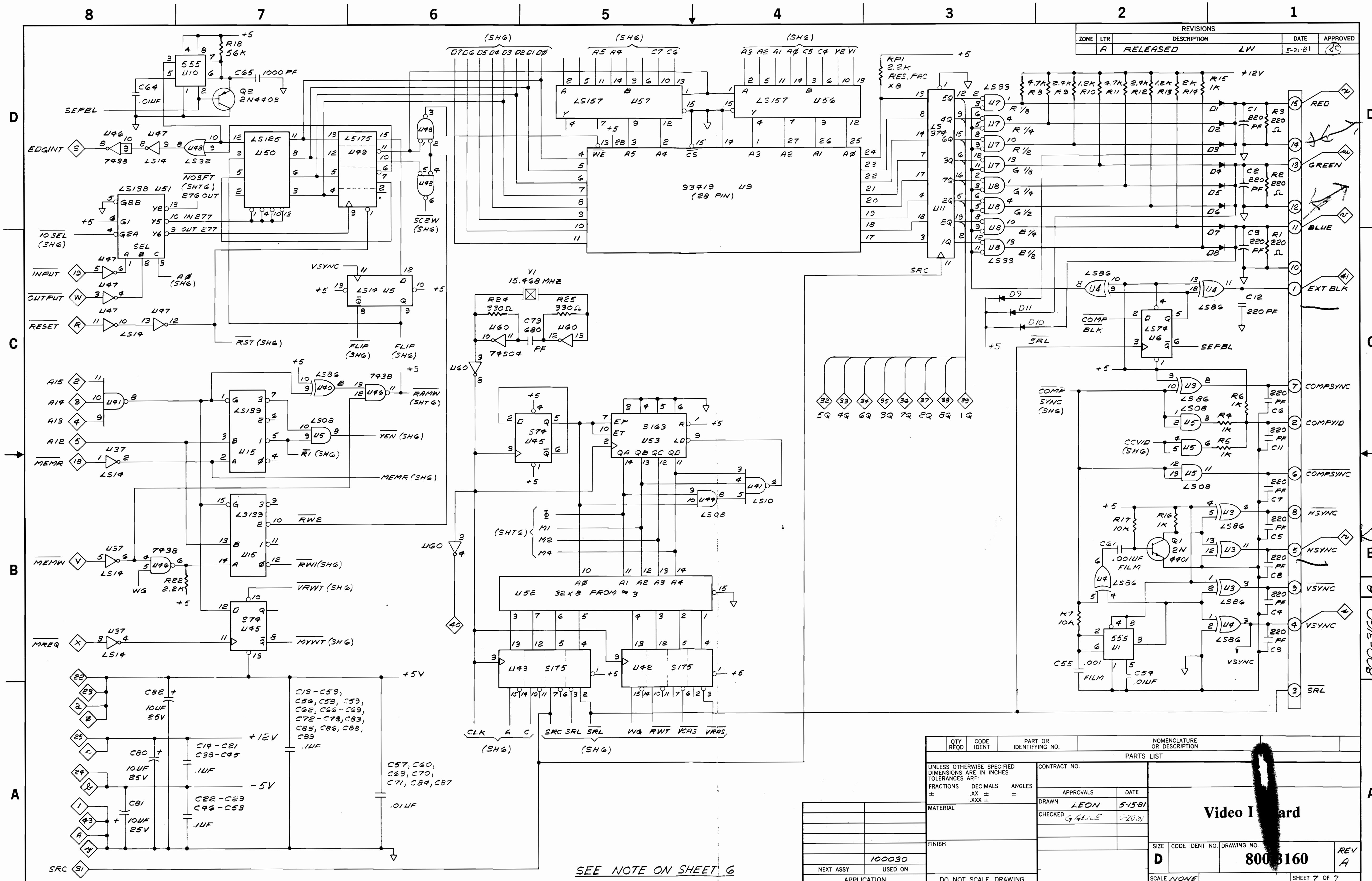
Video I Board Modifications

SIZE	CODE IDENT NO.	DRAWING NO.	REV.
D		800-3160	A

SCALE NONE — SHEET 5 OF 7

800-3160 A


REVISIONS
ZONE LTR DESCRIPTION DATE APPROVED
A RELEASED 5-21-81
315-0042
U58
SEE 800-0111
HARDWARE SHIFTER
U12
VSH 1
28 PIN
NOTES:
100030
NEXT ASSY USED ON
APPLICATION
DO NOT SCALE DRAWING
PARTS LIST
QTY REQD CODE IDENT PART OR IDENTIFYING NO. NOMENCLATURE OR DESCRIPTION
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS DECIMALS ANGLES
MATERIAL
FINISH
CONTRACT NO.
APPROVALS DATE
DRAWN J.FLORES 5-15-81
CHECKED G GRICE 5-21-81
Gremlin Industries, Inc.
San Diego, California 92123
Video 1 Board
SIZE D CODE IDENT NO. DRAWING NO. 800-3160 REV A
SCALE NONE SHEET 6 OF 7
800-3160 A



ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED LW	5-21-81	[illegible]

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

NEXT ASSY 100030 USED ON

APPLICATION

CONTRACT NO.

APPROVALS	DATE
DRAWN LEON	5-15-81
CHECKED G GALICE	5-20-81

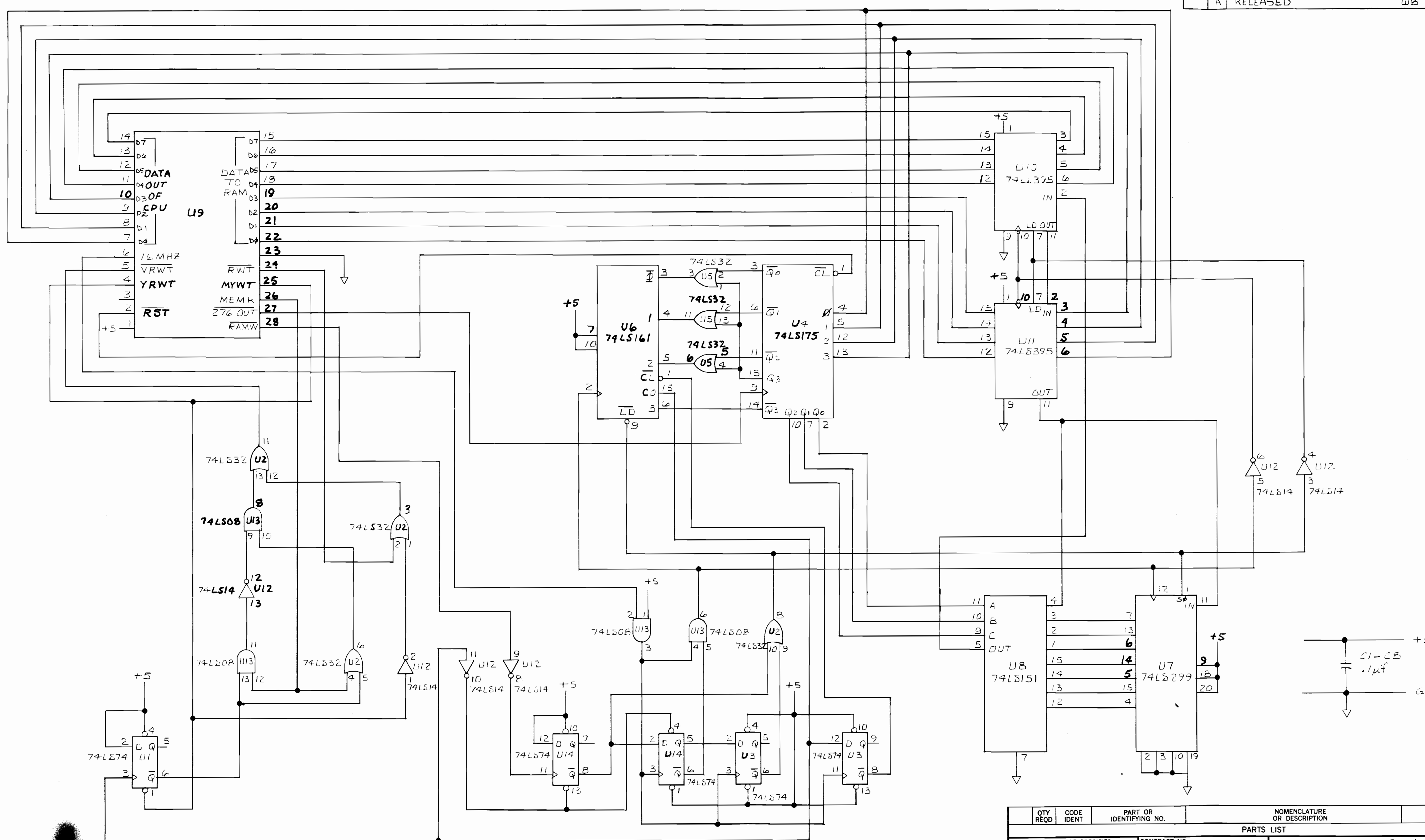
Video I[redacted]ard

SIZE D CODE IDENT NO. DRAWING NO. 800[redacted]3160 REV A

SCALE NONE SHEET 7 OF 7

800-3160 A

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED WB	6-4-81	



QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

NEXT ASSY | USED ON

APPLICATION

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN	3-24-81
CHECKED	3-25-81
	6-4-81

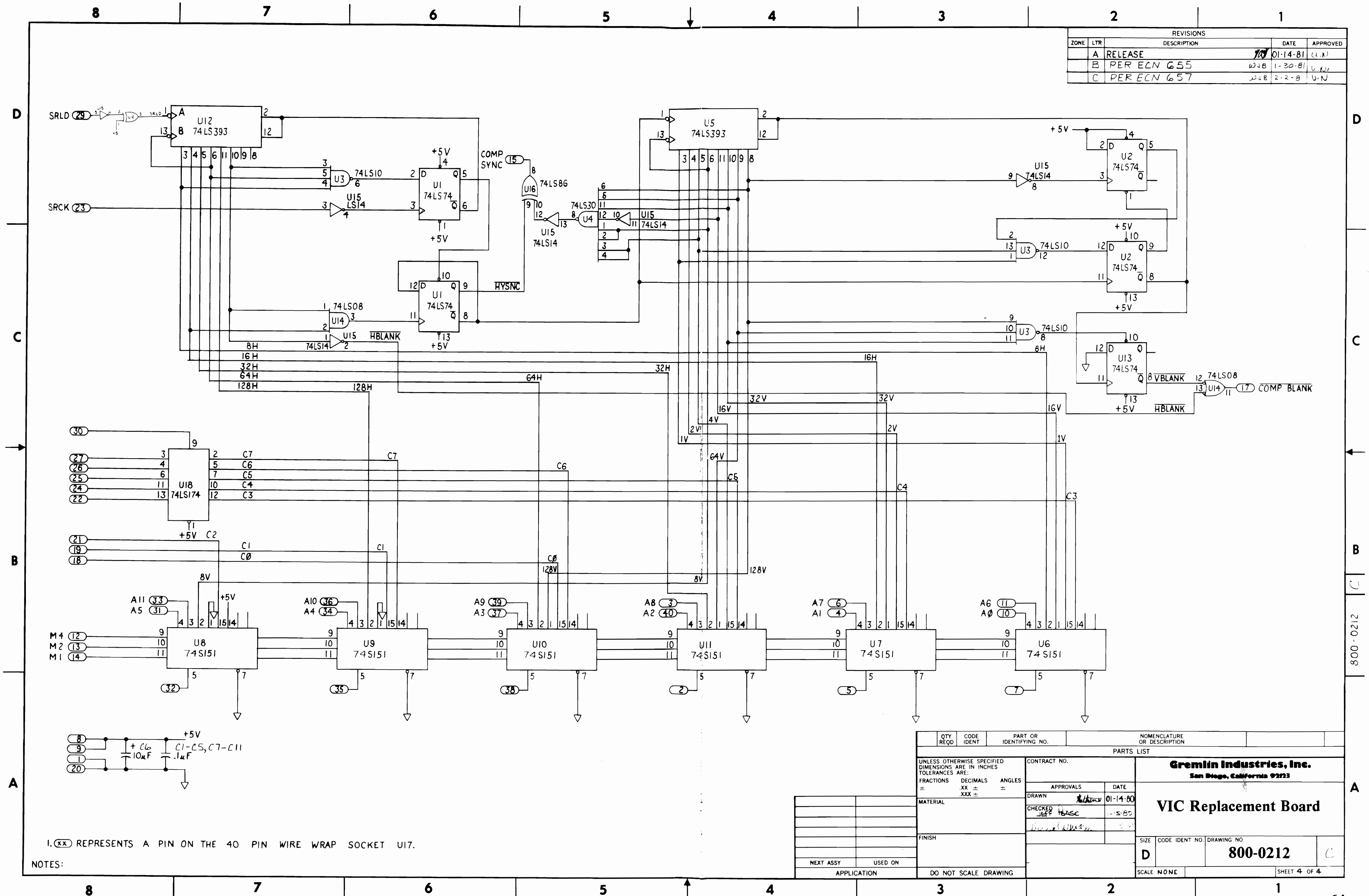
Gremlin Industries, Inc.
San Diego, California 92123

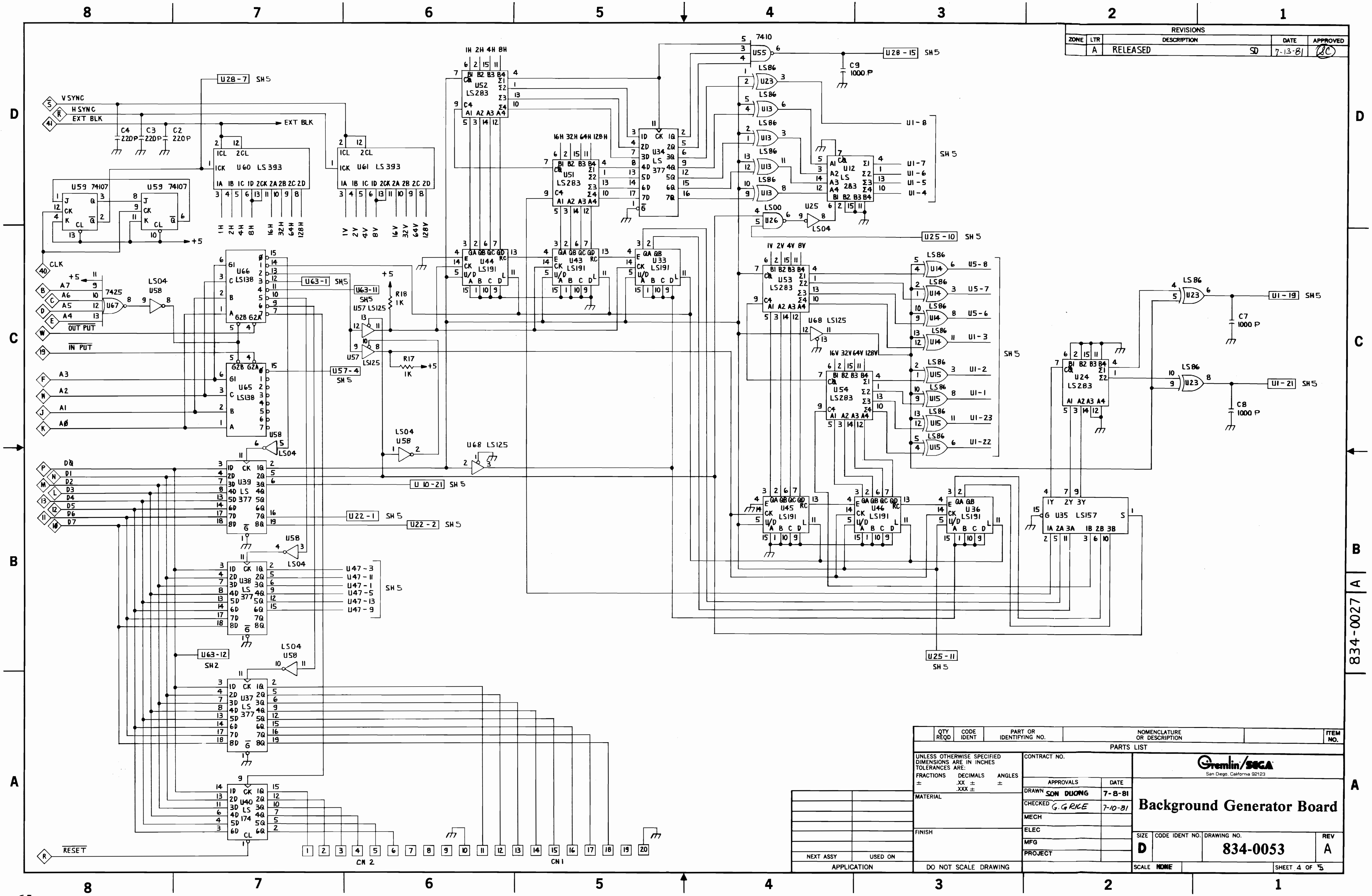
Hardware Shifter

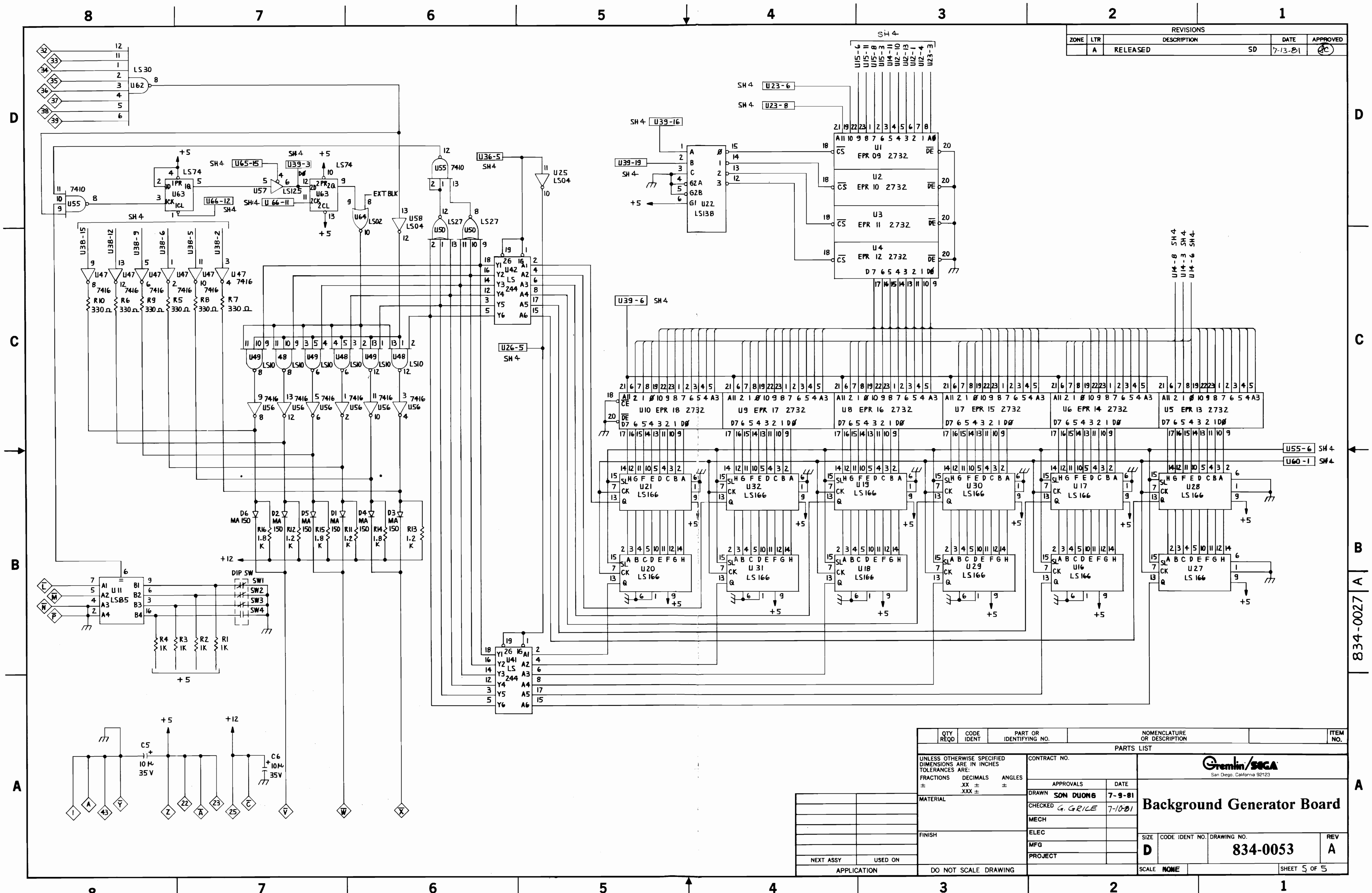
SIZE D | CODE IDENT NO. | DRAWING NO. 800-0111 | REV A

SCALE NONE | SHEET 4 OF 4

800-0111 A


REVISIONS
ZONE | LTR | DESCRIPTION | DATE | APPROVED
A RELEASE 01-14-81
B PER ECN 655 1-30-81
C PER ECN 657 2-2-8
U12 74LS393
U5 74LS393
U1 74LS74
U2 74LS74
U13 74LS74
U3 74LS10
U15 74LS14
U14 74LS08
U16 74LS86
U4 74LS30
U18 74LS174
U8 74S151
U9 74S151
U10 74S151
U11 74S151
U7 74S151
U6 74S151
SRLD
SRCK
COMP SYNC
HYSNC
HBLANK
VBLANK
COMP BLANK
M4
M2
M1
+5V
C1-C5, C7-C11 .1µF
C6 10µF
1. (XX) REPRESENTS A PIN ON THE 40 PIN WIRE WRAP SOCKET U17.
NOTES:
PARTS LIST
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWING
NEXT ASSY
USED ON
APPLICATION
Gremlin Industries, Inc.
San Diego, California 92123
VIC Replacement Board
DRAWN 01-14-80
SIZE D
DRAWING NO. 800-0212
SCALE NONE
SHEET 4 OF 4


REVISIONS
ZONE | LTR | DESCRIPTION | DATE | APPROVED
A | RELEASED | SD | 7-13-81
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS DECIMALS ANGLES
MATERIAL
FINISH
CONTRACT NO.
APPROVALS DATE
DRAWN SON DUONG 7-8-81
CHECKED G. GRICE 7-10-81
MECH
ELEC
MFG
PROJECT
Gremlin/SEGA
San Diego, California 92123
Background Generator Board
SIZE D
DRAWING NO. 834-0053
REV A
SCALE NONE
SHEET 4 OF 5
DO NOT SCALE DRAWING
NEXT ASSY USED ON
APPLICATION
PARTS LIST
834-0027 A
VSYNC
HSYNC
EXT BLK
CLK
OUT PUT
IN PUT
RESET
CN 2
CN 1



ZONE	LTR	REVISIONS DESCRIPTION		DATE	APPROVED
	A	RELEASED	SD	7-13-81	

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

NEXT ASSY | USED ON

APPLICATION

DO NOT SCALE DRAWING

CONTRACT NO.

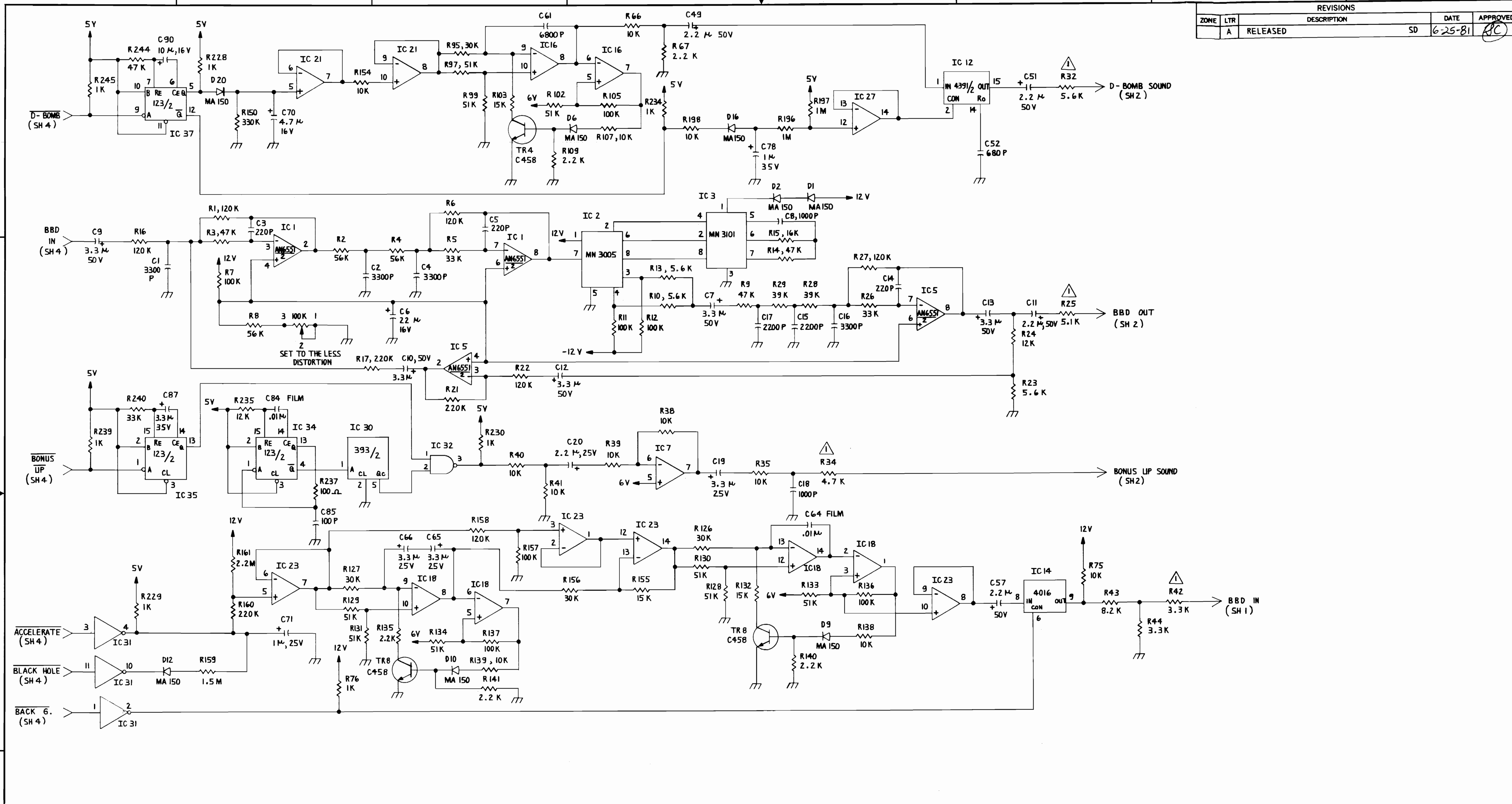
APPROVALS		DATE
DRAWN	SON DUONG	7-9-81
CHECKED	G. GRILE	7-10-81
MECH		
ELEC		
MFG		
PROJECT		

Gremlin/SEGA
San Diego, California 92123

Background Generator Board

SIZE D | CODE IDENT NO. | DRAWING NO. 834-0053 | REV A

SCALE NONE | SHEET 5 OF 5



ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED SD	6-25-81	

⚠ VALUE OF RESISTOR CAN BE CHANGED FOR ADJUSTMENT.

NOTES :

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

NEXT ASSY | USED ON

APPLICATION

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS		DATE
DRAWN	SON DUONG	6-23-81
CHECKED	G. GRICE	6-24-81
MECH		
ELEC		
MFG		
PROJECT		

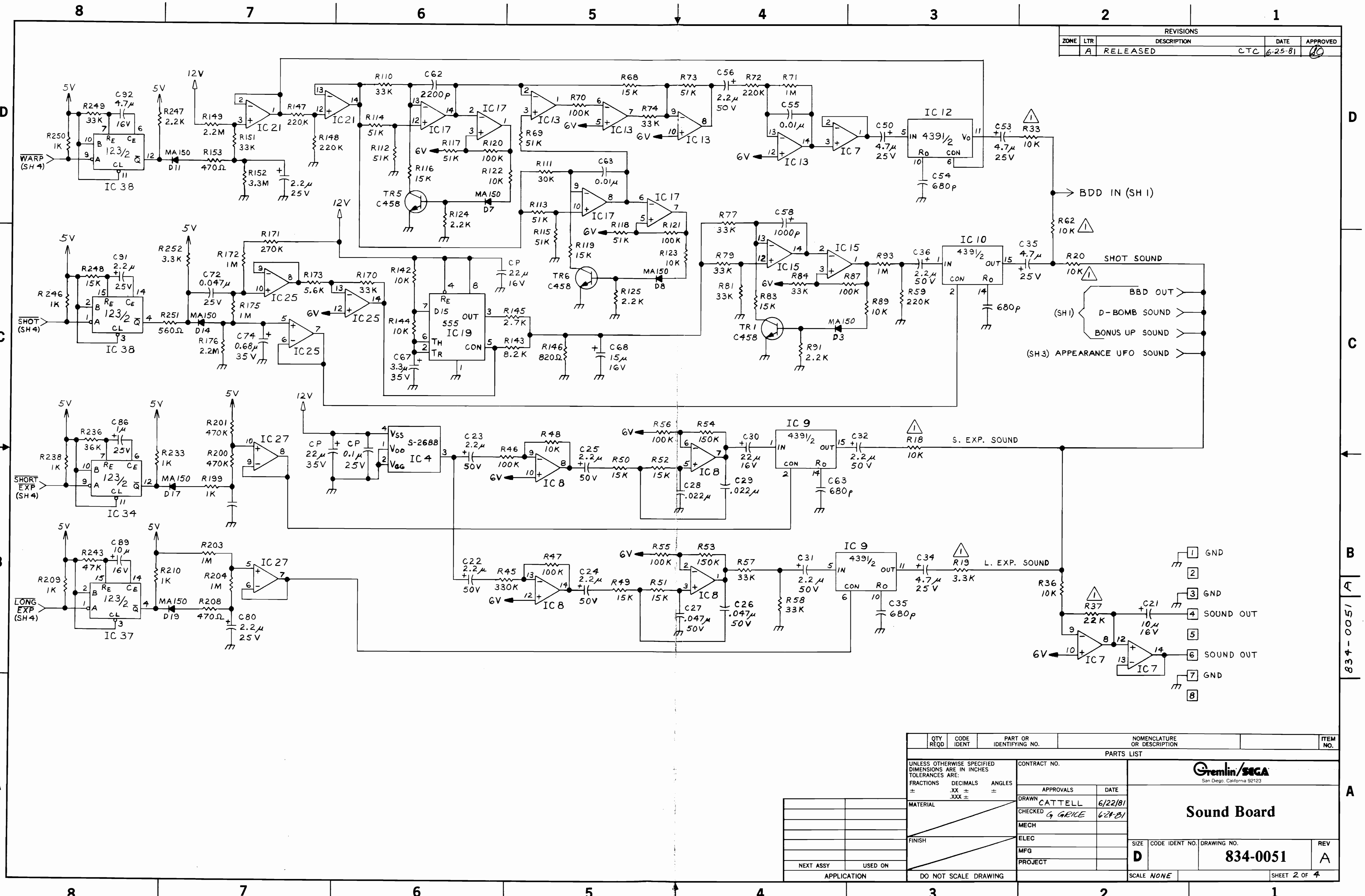
Gremlin/SEGA
San Diego, California 92123

Sound Board

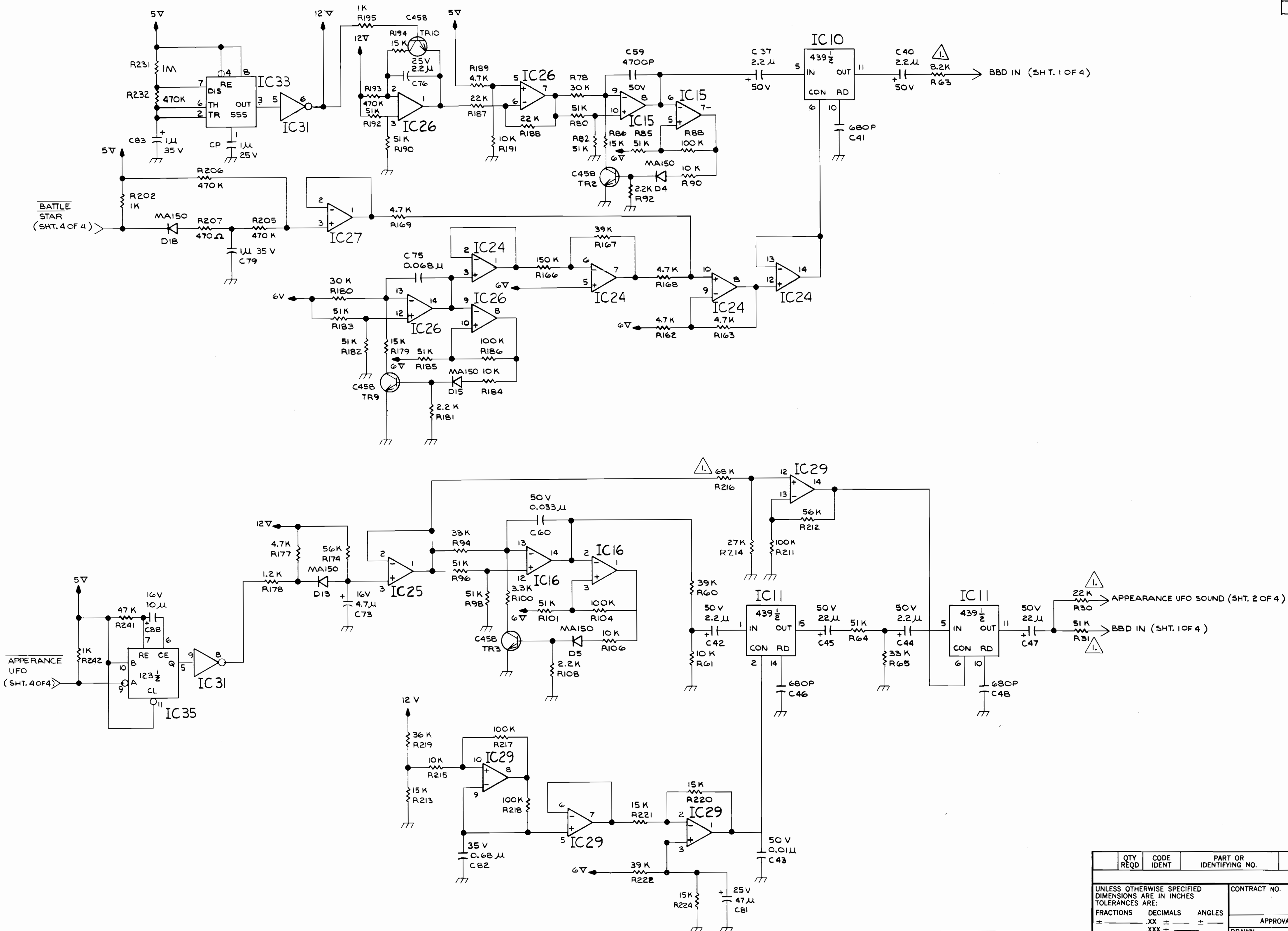
SIZE D | CODE IDENT NO. | DRAWING NO. 834-0051 | REV A

SCALE NONE | SHEET 1 OF 4

834-0051 A


REVISIONS
ZONE LTR DESCRIPTION DATE APPROVED
A RELEASED CTC 6-25-81
WARP (SH 4)
SHOT (SH 4)
SHORT EXP (SH 4)
LONG EXP (SH 4)
IC 38
IC 34
IC 37
IC 21
IC 17
IC 13
IC 12
IC 7
IC 25
IC 19
IC 15
IC 10
IC 27
IC 4
S-2688
IC 9
IC 8
TR5 C458
TR6 C458
TR1 C458
BDD IN (SH 1)
SHOT SOUND
BBD OUT
(SH 1)
D-BOMB SOUND
BONUS UP SOUND
(SH 3) APPEARANCE UFO SOUND
S. EXP. SOUND
L. EXP. SOUND
GND
SOUND OUT
834-0051 A
PARTS LIST
QTY REQD
CODE IDENT
PART OR IDENTIFYING NO.
NOMENCLATURE OR DESCRIPTION
ITEM NO.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ±
DECIMALS .XX ± .XXX ±
ANGLES ±
MATERIAL
FINISH
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING
CONTRACT NO.
APPROVALS
DATE
DRAWN CATTELL 6/22/81
CHECKED G GRICE 6-24-81
MECH
ELEC
MFG
PROJECT
Gremlin/SEGA
San Diego, California 92123
Sound Board
SIZE D
CODE IDENT NO.
DRAWING NO. 834-0051
REV A
SCALE NONE
SHEET 2 OF 4

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED J.F.	6-25-81	



QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

NEXT ASSY | USED ON

APPLICATION

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS		DATE
DRAWN	J. FLORES	6-19-81
CHECKED	G GRILE	6-24-81
MECH		
ELEC		
MFG		
PROJECT		

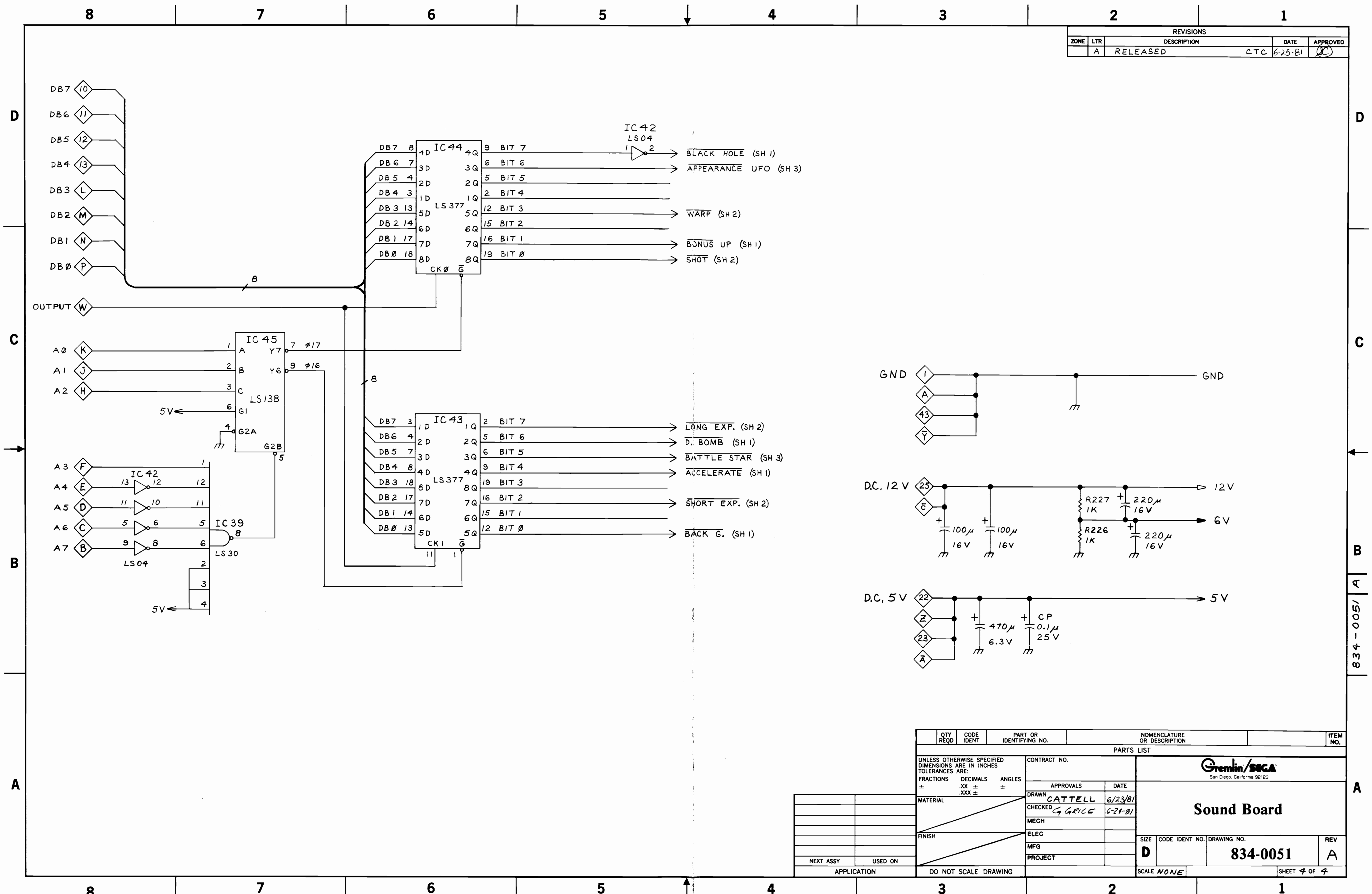
Gremlin/SEGA
San Diego, California 92123

Sound Board

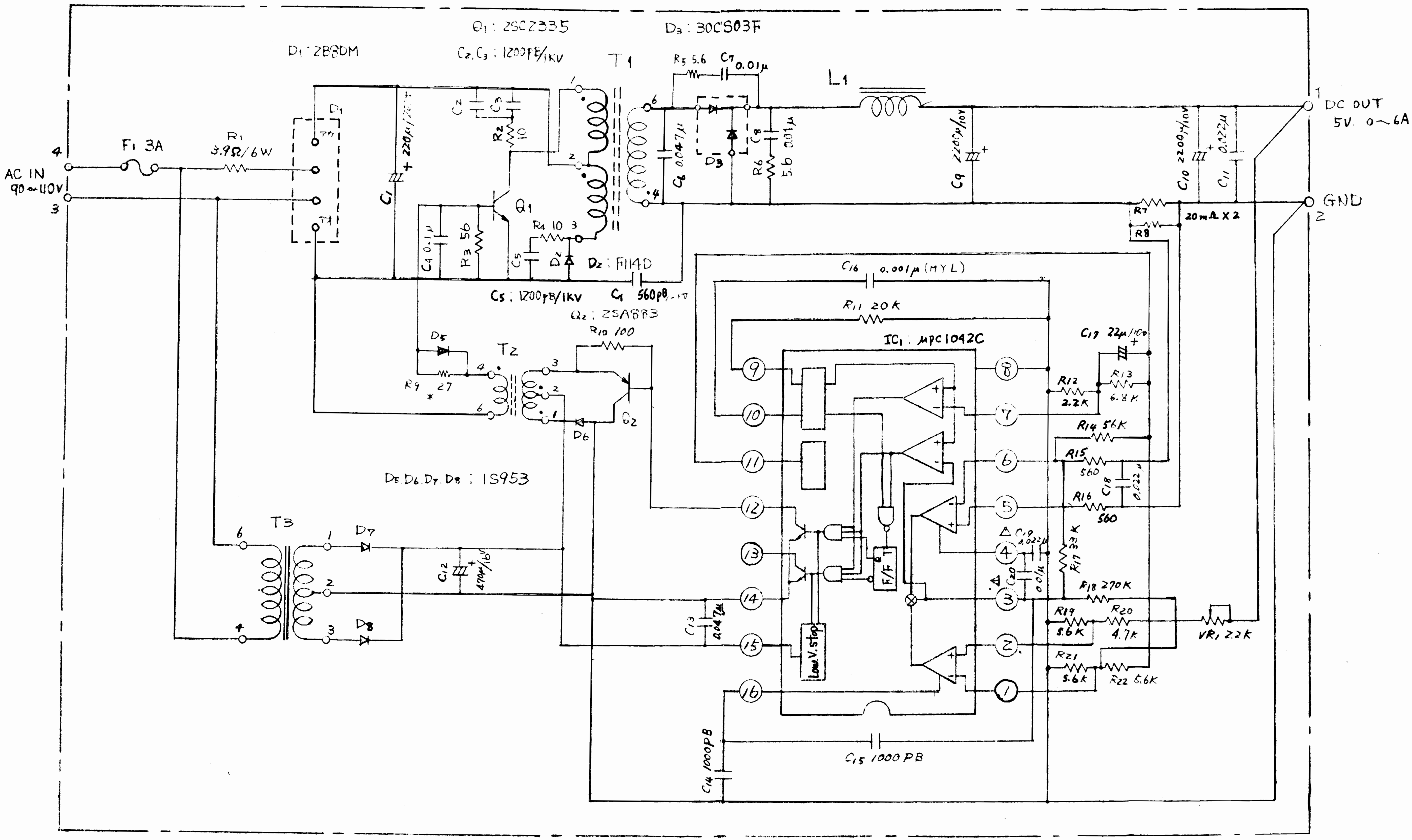
SIZE D | CODE IDENT NO. | DRAWING NO. 834-0051 | REV A

SCALE NONE | SHEET 3 OF 4

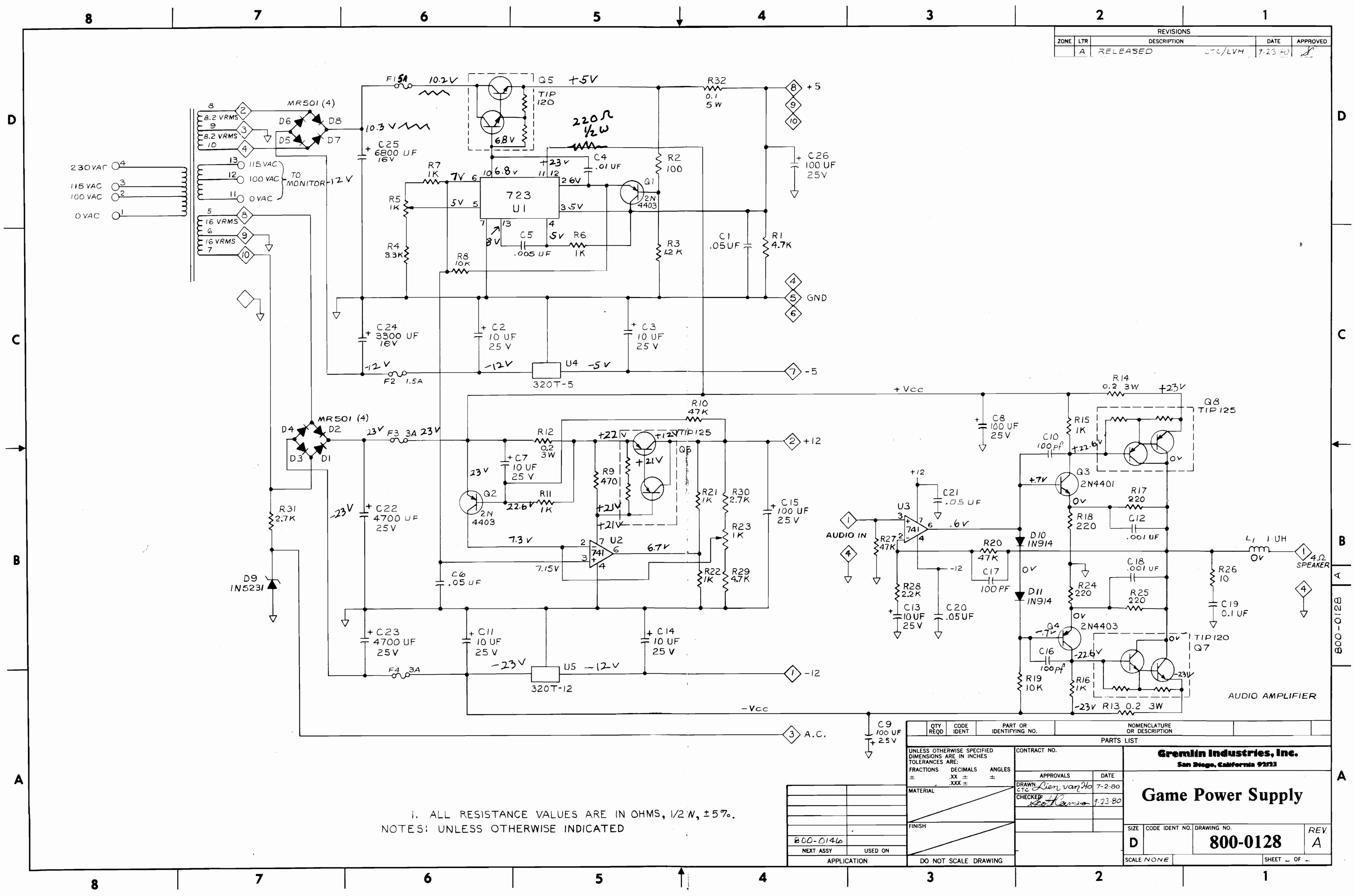
834-0051 A



REVISIONS
ZONE | LTR | DESCRIPTION | DATE | APPROVED
A RELEASED CTC 6-25-81
DB7 10
DB6 11
DB5 12
DB4 13
DB3 L
DB2 M
DB1 N
DBØ P
OUTPUT W
8
IC44
LS377
4D 3D 2D 1D 5D 6D 7D 8D
4Q 3Q 2Q 1Q 5Q 6Q 7Q 8Q
CKØ G
BIT 7
BIT 6
BIT 5
BIT 4
BIT 3
BIT 2
BIT 1
BIT Ø
IC42
LS04
BLACK HOLE (SH 1)
APPEARANCE UFO (SH 3)
WARP (SH 2)
BONUS UP (SH 1)
SHOT (SH 2)
IC45
LS138
A0 K
A1 J
A2 H
Y7 Ø17
Y6 Ø16
G1
G2A
G2B
5V
A3 F
A4 E
A5 D
A6 C
A7 B
IC42
LS04
IC39
LS30
IC43
LS377
CK1 G
LONG EXP. (SH 2)
D. BOMB (SH 1)
BATTLE STAR (SH 3)
ACCELERATE (SH 1)
SHORT EXP. (SH 2)
BACK G. (SH 1)
GND
GND
D.C. 12 V
12V
6V
R227 1K
R226 1K
220μ 16V
220μ 16V
100μ 16V
100μ 16V
D.C. 5 V
5V
470μ 6.3V
CP 0.1μ 25V
834-0051 A
QTY REQD | CODE IDENT | PART OR IDENTIFYING NO. | NOMENCLATURE OR DESCRIPTION | ITEM NO.
PARTS LIST
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±
MATERIAL
FINISH
NEXT ASSY | USED ON
APPLICATION
DO NOT SCALE DRAWING
CONTRACT NO.
APPROVALS | DATE
DRAWN CATTELL 6/23/81
CHECKED G GRICE 6-24-81
MECH
ELEC
MFG
PROJECT
Gremlin/SEGA
San Diego, California 92123
Sound Board
SIZE D
CODE IDENT NO.
DRAWING NO. 834-0051
REV A
SCALE NONE
SHEET 4 OF 4



Switching Regulator
601-0158


REVISIONS
A RELEASED
AUDIO AMPLIFIER
1. ALL RESISTANCE VALUES ARE IN OHMS, 1/2 W, ±5%.
NOTES: UNLESS OTHERWISE INDICATED
PARTS LIST
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWING
Gremlin Industries, Inc.
San Diego, California 92123
Game Power Supply
800-0128
REV A
SCALE NONE

YOUR COMMENTS, PLEASE!

Your comments will assist us in improving the usefulness of our publications. They are an important part of preparing for revisions of manuals and parts catalogs.

If you have any technical questions about any SEGA/GREMLIN game, are requesting additional publications, or have a suggestion about how we can make our manuals more useful to you, drop us a line or use the handy form below. We value your input.

Comments:

Fill in if you wish a reply:

Name____________________ Firm____________________ ☐ Distributor

Address____ ☐ Operator

City____________ State____________ Zip____________ ☐ Other____________

SO

First Fold

FIRST CLASS
PERMIT NO. 10129
San Diego, California

BUSINESS REPLY MAIL

No Postage Stamp Necessary If Mailed In The United States

POSTAGE WILL BY PAID BY:

SEGA/Gremlin
8401 Aero Drive
San Diego, CA. 92123

Attn: Customer Service

Second Fold

Tape This Edge

